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•

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•

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Partial Lower Denture Design

IRVING R. HARDY, D.M.D.,
New York

PARTIAL LOWER DENTURES have long been a problem to the dental profession. Some excellent operative dentists have been so discouraged with the results obtained that they have advised patients with missing posterior teeth against the use of a partial lower denture, for they felt that the harm done by the appliance would more than outweigh the good accomplished. Another group of operators, often less skillful, and certainly less altruistic in attitude, have made the dentures and inserted them. Such dentures are either worn with dis-

(*Text continued on page* 61)

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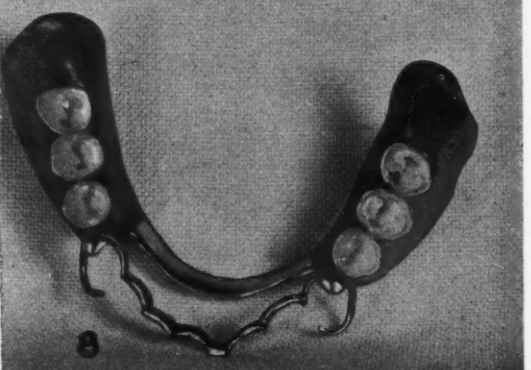

Fig. 1—Model of case requiring construction of a lingual bar lower denture to occlude with a full upper denture. The remaining teeth are sound and firm. The patient reported that she had a lower partial denture which could not be worn because of the discomfort caused by its use. It did not have proper occlusal support because the bicuspid teeth which would act as the primary abutments had never been prepared to receive occlusal rests.

Fig. 2—Cross section of a bicuspid with depression created in enamel which is to receive a supporting lug rest from a denture. When pressure is applied, lug will seat itself firmly in declivity.

Fig. 3—Preparation often seen with the slope of the floor in the wrong direction. A lug having such a poorly constructed seat will, when pressure is applied, tend to slide off the tooth. When such a movement occurs the saddle portion of the appliance will be thrown out of position on the underlying tissue and the whole mechanism is thrown out of adjustment.

Fig. 4—Cross section of model at a point between the second bicuspid and first molar. This is typical knife-edged ridge which entails difficulty with poorly constructed dentures. Properly formed lug rests on the bicuspids, however, will help take direct vertical stress off these poor ridges.

Fig. 5—Cross section of model in the region of distal of first molar. Here the ridge has definitely widened; portion between white lines is nearly a horizontal plateau, well capable of bearing the load of a denture

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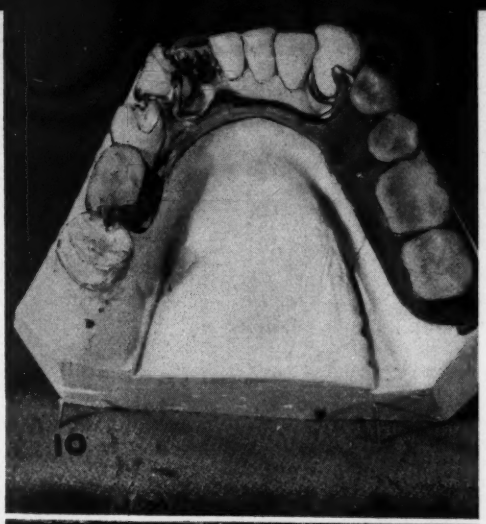
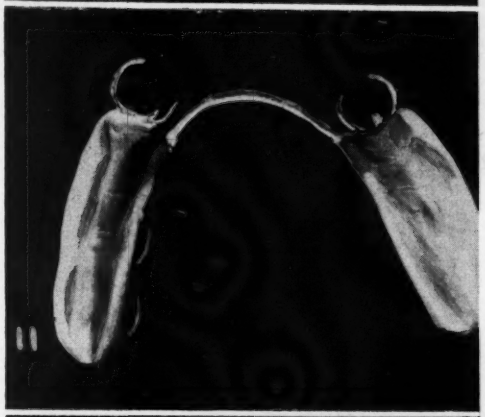
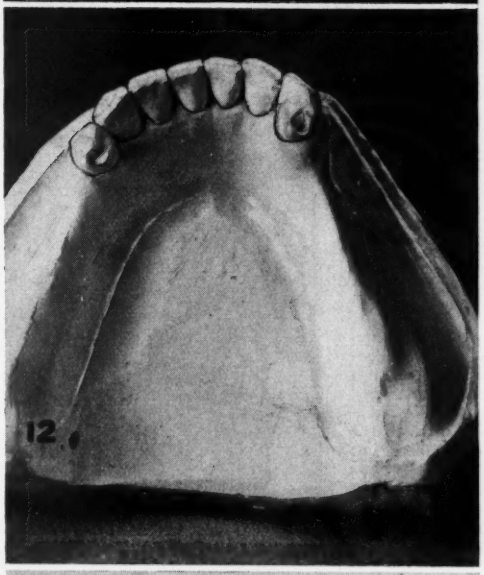
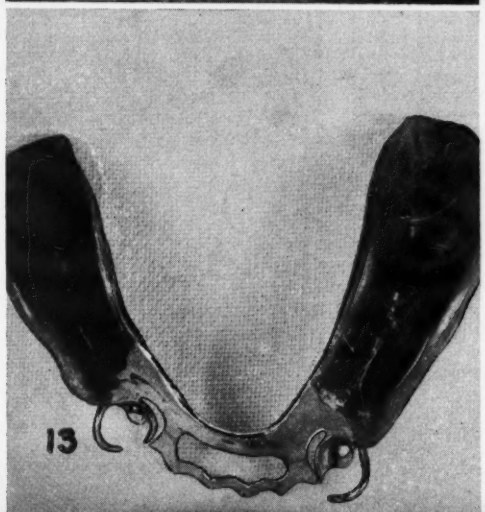








of occlusion here employed is mechanical rather than anatomic.

Fig. 10—Method sometimes employed when lower cuspid is to serve as primary abutment. This has negligible value as a supporting structure. Perhaps this rest was a factor in forcing this lower cuspid out of alinement. As support for a partial denture, it was inadequate and did not serve the purpose intended.

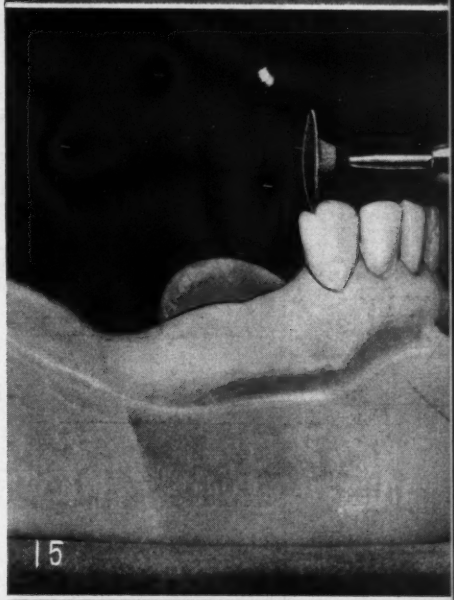
Fig. 11—Denture that had as primary abutments on one side a first bicuspid; on the other side, a cuspid. On the cuspid the only rest afforded was as shown in Fig. 10, a finger on an inclined plane. This type of rest is almost entirely useless as a support. On the bicuspid an occlusal lug was provided, but it was placed on a tooth not properly prepared to receive it. Saddle areas were too small. Denture was a failure.

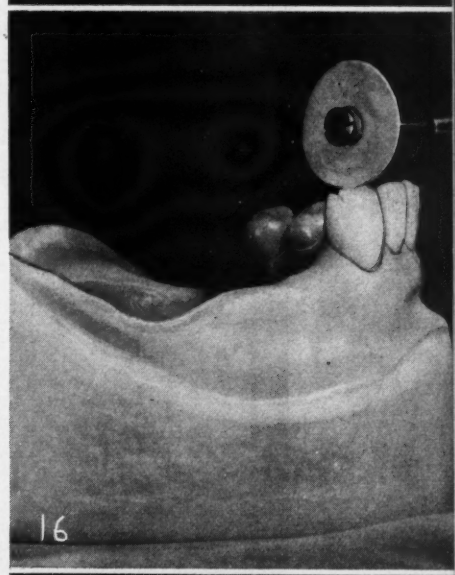
Figs. 12 and 13—Fig. 12 is a model of mouth after proper preparation for occlusal rests. For the cuspid a disto-incisal inlay was constructed with a definite pocket for a rest. The bicuspid was prepared as shown in Fig. 2. Denture was then constructed (Fig. 13) with large saddle areas, proper rests on the primary abutments, and an auxiliary bar to enable the cuspid, which approximated the bicuspid abutment, to act as a secondary supporting structure against lateral stress. Denture functions mainly against natural upper teeth and has given comfortable service for several years.

Fig. 14—Another type of supporting lug as it appears in mouth, which may often be used in mandibular cuspids. Will function as definite support for denture. It is prepared by creating a notch in cutting edge of tooth. Cut is started with a knife-edged stone at a point about one-third the distance from mesio-incisal angle to crest of cusp. Notch is carried well over labial side and into lingual enamel plate. After cutting with the stone is finished, the preparation is smoothed with sandpaper discs, all grinding being done in such a way as to leave a definite notched seat to receive a finger which will occupy it. If preparation is made as described, the upper border of the finger forms an almost continuous plane with anterior slope of cusp. For this reason, it is not too conspicuous. If this small display of gold is objectionable, then rest may be placed in a properly prepared notch in distal slope of tooth where it will be less noticeable.

Figs. 15 and 16—Method of preparation for distal slope notch.

Fig. 17—A large size model of a plaster tooth cut for mesial slope notch.





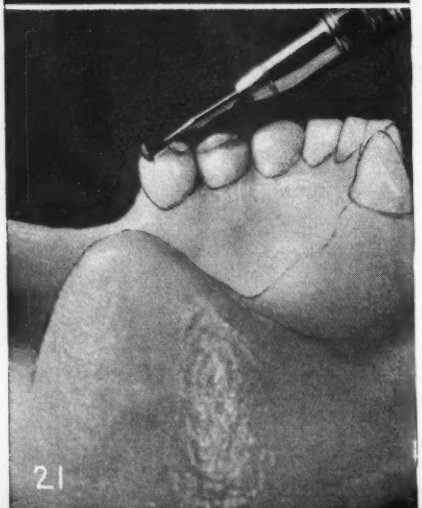


Fig. 18—Occupying lug in place and round wire labial arm used in connection with it.

Fig. 19—View of lingual side, showing rigid lingual casting and incisal finger.

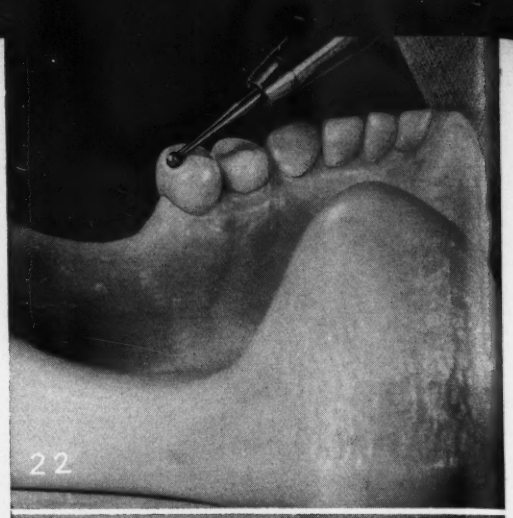
Fig. 20—Distal of cuspid and junction of adjustable wire labial clasp with rigid lingual arm.

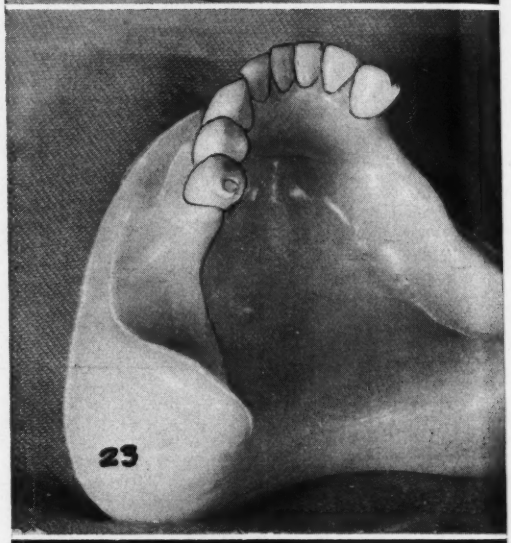
Fig. 21—In preparing occlusal rests in bicuspids which have no restorations, a small stone is employed. If the teeth in opposition to this abutment are artificial, it is only necessary to smoothe the disto-occlusal sulcus until its seat is round and smooth. If opposing teeth are natural, more room must be provided for bulk and strength of metal in the lug. Sometimes additional room may be obtained by judiciously shortening the cusp of the upper tooth where it drops into the distal sulcus of the lower tooth. But the rest when completed must have its deepest portion near the long axis of the tooth.

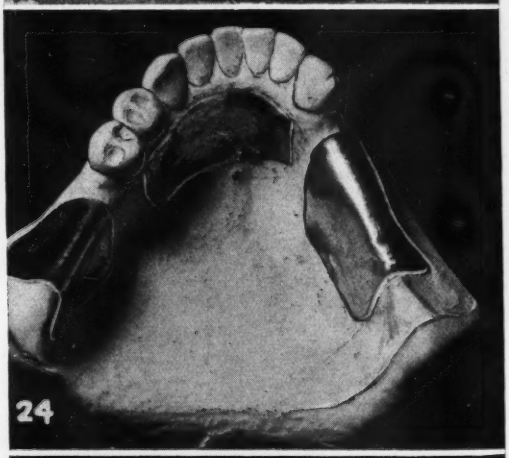
Fig. 22—After stone grinding is done, preparation is smoothed with a plug finishing bur. If the enamel, which is heavy at this point, is not ground through, decay seldom occurs at this ground portion. Decay is more likely to occur at the disto-gingival margin of this tooth than at the lug rest; if such decay occurs, the same course is followed as with caries at any point: the caries is removed and the cavity restored.

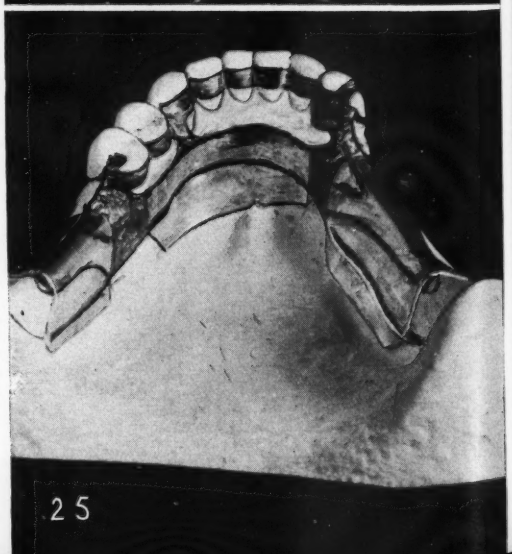
Fig. 23—All teeth posterior to cuspid were missing on one side; on the other side, both bicuspids were present, but the molars were missing. This is a difficult type to restore. An impression is obtained with a technique that will insure an accurate negative of all supporting teeth and full extension of impression into all tissue areas that can be comfortably covered by the finished saddles. Colloidal materials are now widely used for partial denture impressions. These materials, when correctly handled give excellent impressions of the teeth and tissues at rest, but they do not take the tissue that will be under the saddles in a state of compression. (This discrepancy can, of course, be compensated for by rebasing the case when completed, before it is delivered to the patient.) I still use for most cases a sectional modeling compound technique in which I compress the tissue as the impression is taken. For saddles on all cases I use either vulcanite or one of the phenol resins, so that rebasing can be done easily if at any time the case requires it. All dentures do require such service at intervals.

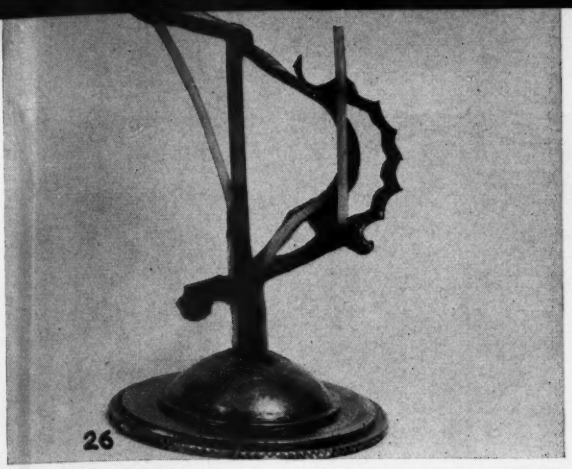
Fig. 24—Having obtained a satisfactory impression, a stone model is made and on this model are burnished three metal shims. The two

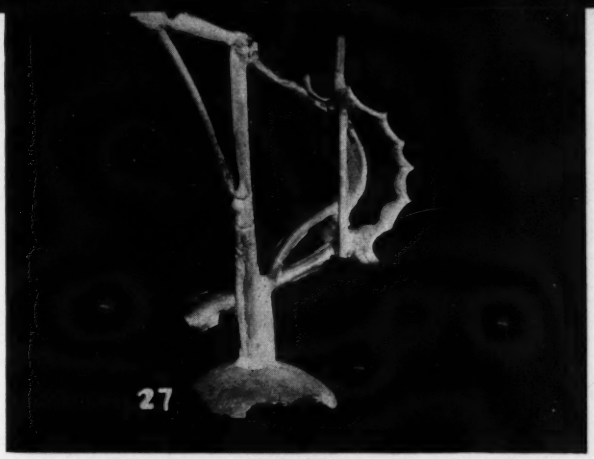


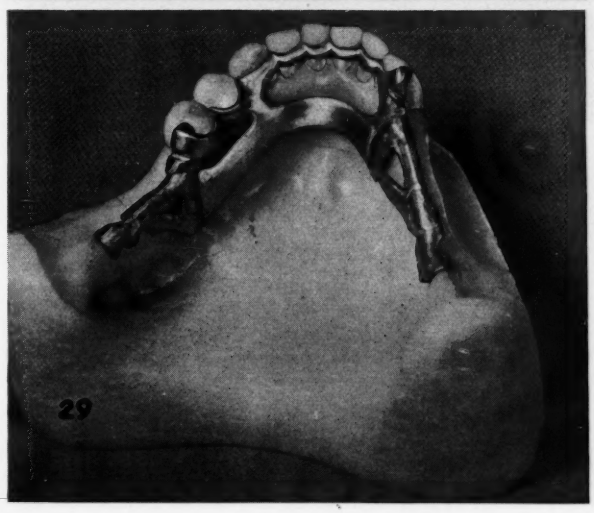


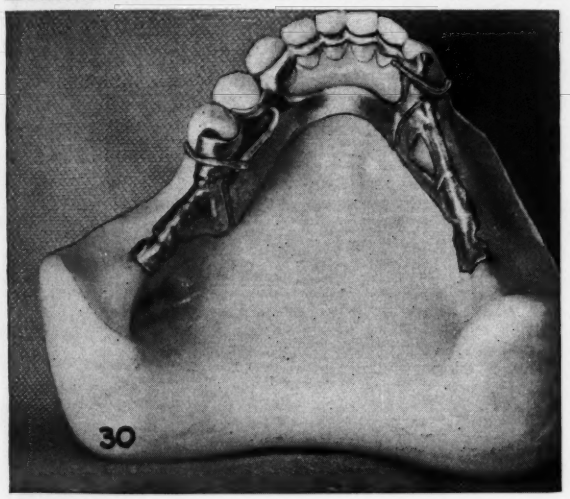












posterior shims are relief chamber metal. They are placed to raise the wax pattern away from the cast at every point in the saddle area except its most distal portion which makes contact with the model: thus room is allowed under casting for plastic material of saddles to flow in around the metal and obtain a firm hold. The anterior shim is of tin foil (gauge 003), burnished and cemented to model to hold lingual bar away from cast, and hence, from the underlying tissue and to prevent impingement.

Fig. 25—Same cast as Fig. 24, with pencilled design. The distance from second bicuspid to opposite cuspid was so great, it was necessary to run a strut down from the continuous clasp to the lingual bar to stiffen case somewhat. Case is now waxed up, and lingual bar is waxed from 24 gauge wax. It is in cross section, ovoid shape, heavy at lower margin where three thicknesses of wax are used. This waxing, done in tapering form, gives a finished bar which is thin enough at its upper margin so that it does not feel bulky to the tongue; but its lower margin (which is not so readily explored by the tongue) is heavy enough to provide rigidity and allow stock enough for trimming if the denture should settle down so that the bar impinges on the tissue beneath it. The continuous clasp portion is waxed from 26 gauge wax, strengthened by flowing on a little inlay wax to belly it out in its median portion. In other words, its upper and lower margins are thin, so that they hug the teeth and do not afford a definite broad joint to annoy the tongue. The thickening made by flowing inlay wax, is in the center of the bar where the tongue will not readily sense the additional bulk.

Fig. 26—Completed wax-up and method of sprueing. Straight upright sprue extending entirely across pattern is of metal, thickened with wax where it approached the sprue-forming base to allow a fairly large opening for quick access of gold into mold. Leading from this main sprue are two auxiliary sprues (in lighter colored wax) to aid flowing of molten gold; a third sprue extends from cuspid clasp across to region of reinforcing strut, and extends beyond pattern to guard against pocketing of air at this point. The bicuspid clasp is not included in this main casting; it will be added later.

Fig. 27—Casting as removed from investment. This casting is cleaned and placed on model; any points of interference in proper seating are carefully eliminated; the pattern for rigid part of bicuspid clasp (not included in main casting) is waxed.

Fig. 28—Clasp pattern. After casting, this and main casting are assembled on model and will be seen to fit accurately into place. The primary abutments (right cuspid and left second bicuspid) are now surveyed and 18 gauge round wire clasps bent to fit a point just below the greatest bulge of the buccal contour of the teeth. In this case, it fell on both teeth well toward the gingival. It is preferable to have the buccal wires rest higher on the teeth, for it seems that the nearer the gingival that the clasp grips, the greater is the chance for decay beneath it. This, however, is not a factor in the operator's control and the clasp, in order to grip, must be below the greatest buccal contour.

Fig. 29—In the castings on the abutment teeth, grooves are cut to accommodate the bent wire clasps.

Fig. 30—Wire clasps are placed and secured to both the model teeth and the casting with sticky wax.

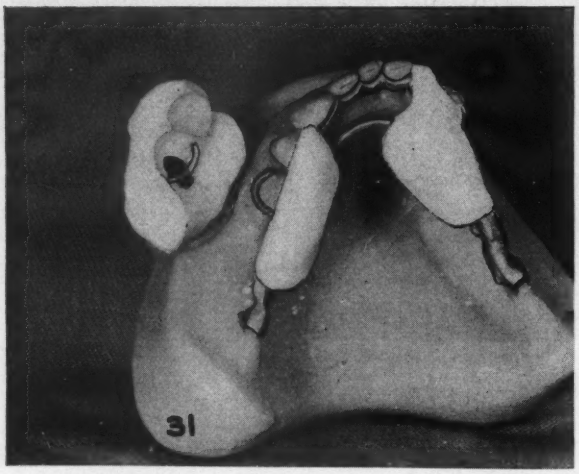


Fig. 31—When the wire clasps are thus secured, impression (not model) plaster is flowed about the waxed joints and when hard is split away. Note buccal section of plaster split away from bicuspid; in this segment is seen the sharp impression of wire clasp and blob of sticky wax which held it in place on tooth and which came away with it.

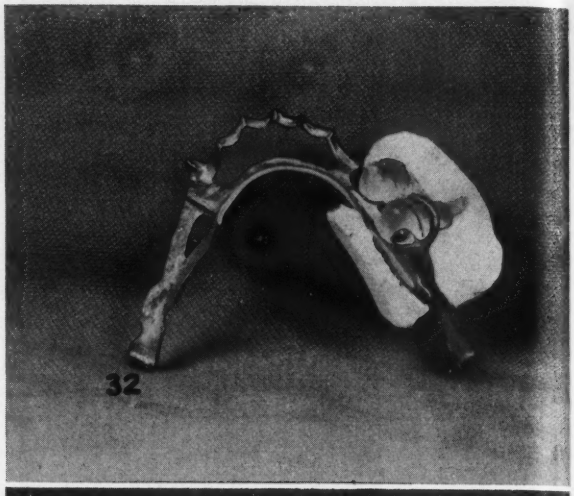


Fig. 32—Sticky wax is washed out of plaster with hot water, and broken segments are reassembled. Note assembly. This is soaked well with water and soldering investment is flowed into impression.

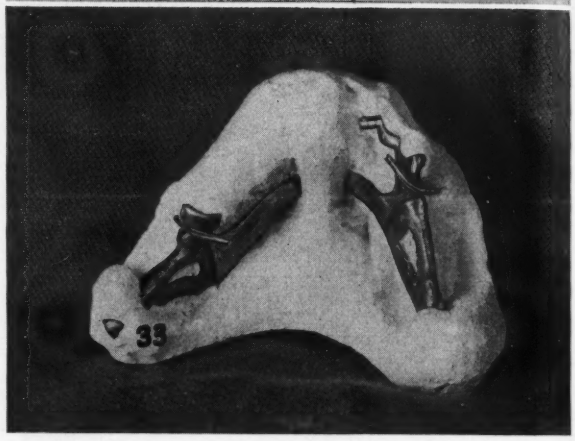
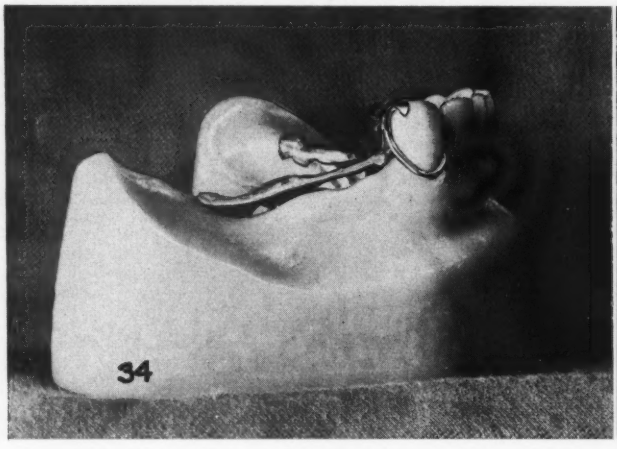


Fig. 33—When soldering investment is hard, plaster is split away and additional investment material is flowed about the casting and clasps to stabilize the parts and prevent any warpage during soldering process. Only a small quantity of solder is used; because the wires rest in grooves in which they are an approximate fit, little solder is necessary. Care is taken not to overheat the case. After soldering, case is allowed to cool in investment; it is trimmed, smoothed, and polished.



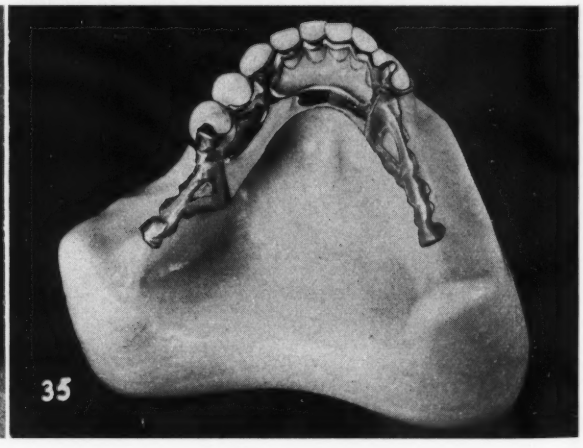


Fig. 34—Side view of piece that shows cuspid lug and clasp; also that part of skeleton which will be embedded in saddle. It will be noted that this portion makes contact with cast only at its extreme distal portion. When case is packed with plastic material for saddles, material will flow around metal and grasp it firmly. At the same time, when pressure is applied to flask to force material into place, distal portion which makes contact with the model will prevent any springing of skeleton.

Fig. 35—Finished skeleton case shown on model. It is a rigid piece, well capable of sustaining any reasonable strain placed upon it. Its only vulnerable points are its wrought labial clasps. These adjustable arms sometimes break. One cause of breakage is injudicious adjustment of these arms. In making adjustments, it should be borne in mind that the portion of clasp that may need adjustment is outer third of arm; this has the greatest holding power. Adjusting pliers are placed in a position to influence only outer third of arm. Avoid bending clasp in such a way that the joint or junction of wire arm with cast arm will be disturbed.

comfort for a while and then discarded, or they are tolerated by the wearer until rapid destruction follows. I have made partial lower dentures, been discouraged by their obvious shortcomings, and for a while joined the group that advised against them.

Looking back over my failures and noting their discrepancies, I find that the main causes for failure were these: (1) lack of proper occlusal support, and (2) inadequate saddle areas.

I now make a great many partial lower dentures which, I believe, function creditably. These dentures are constructed according to the principles laid down by such able men as Bonwill, Nesbett, Cummer, and Kennedy, who have written exhaustively on the subject and to whom we owe a great deal of gratitude.

9 *Rockefeller Plaza.*

ERRATUM

In last month's issue, page 29, an error occurred in the article by Doctor M. Martyn Kafka on THE RELATIONSHIP OF DENTAL INFECTIONS TO DISEASES OF THE EYE. The last word in the second line should read "years" instead of "days." The first sentence would then read, "Of several thousand patients examined by me during the last few years at Bellevue Hospital, 250 definitely showed a close relationship between dental infections and diseases of the orbit."

EMPHATIC REQUIREMENTS OF A LOWER PARTIAL DENTURE DESIGN

I. Proper Occlusal Support

II. Adequate Saddle Areas

I. Proper Occlusal Support:

A. In order to provide a proper seat for an occlusal rest, depressions may be created in the enamel of the tooth to give definite support for the denture (Fig. 1). A metallic restoration in which a depression is created is not necessary.

B. Taking the occlusal plane as a horizontal base line, the floor of any lug rest should be an inclined plane sloping so that its deepest point is toward the central long axis of the tooth.

C. A continuous clasp distributes part of lateral stress to other remaining natural teeth (Fig. 7), so that primary abutments do not assume entire load.

II. Adequate Saddle Areas:

A. Every available millimeter of tissue that will tolerate a saddle must be utilized.

B. Forces that tend to loosen abutment teeth are not so much those that exert a direct downward pressure, but those which exert lateral pressure. In Fig. 6 the direct downward pressure that would not be tolerated by the knife-edged ridge is taken up by the occlusal rest on the primary abutment tooth. The lateral forces that are most likely to loosen the primary abutment tooth are diminished by properly formed saddles.

CAUTION:

Combine in the engaging appliance (clasp) a rigid lingual arm with an adjustable flexible wire buccal arm (Fig. 20). This prevents the appliance from acting as an orthodontic appliance, for all adjustments are made by manipulating the wire arm and even if too much pressure is exerted by the flexible arm, the abutment tooth, because it is definitely cradled in the rigid clasp opposing the wire arm, will not readily be moved out of position. If wire clasps are used both buccally and lingually, especially in connection with a shallow lug rest, one of these arms will usually be adjusted to exert more pressure than the other, with a resulting orthodontic influence on the tooth involved.

The mandibular cuspid "finger support" must be kept free of the bite, so that it will not be subjected to undue wear and be so weakened that its usefulness is destroyed. This type is best used in those cases in which a lingual bar case is constructed against a full upper denture, in which the bite can be opened to allow ample room for clearance.

The Solderless Fixed Movable-Joint Bridge

NEWTON WACHHORST, D.D.S., San Francisco

THE TECHNIQUE TO be described here for a fixed movable joint bridge is simple and easily understandable; it eliminates two or more steps and reduces the time of production; the resulting bridge is stronger and more efficient than the old type of soldered bridge. The possibility of inaccuracies is reduced by carrying the case through on one model and eliminating all soldering.

In describing this technique, I shall take as an example a lower three-unit bridge, in which the lower right first molar is to be replaced. A mesial-occlusal inlay on the second molar and a distal occlusal inlay on the second bicuspid will be used as abutments. A movable joint in the distal portion of the bicuspid inlay is to be constructed.

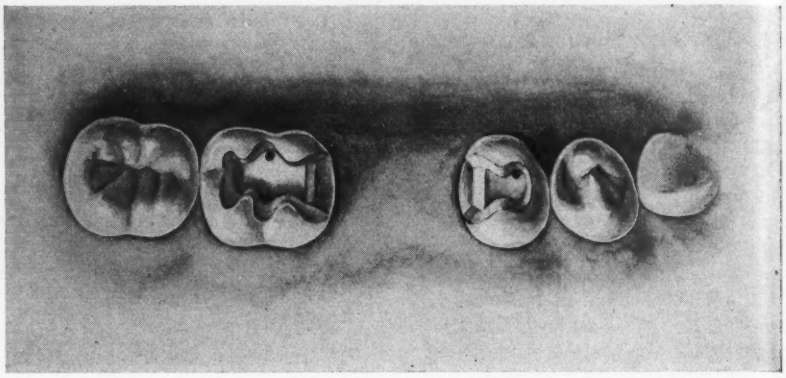


Fig. 1—Cavity preparation with well rounded walls and post holes giving maximum retention.

Technique

1. In utilizing class 2 inlays for abutments, it is obviously necessary to secure as much retention as possible without wasting tooth structure or endangering the pulp. By curving the buccal and lingual walls of the cavity a greater area of retention is had and less tooth structure is lost. To aid retention, it is often advisable to construct post holes about a sixteenth of an inch deep in positions where they will not endanger the pulp (Fig. 1).

2. The bicuspid pattern is carved and placed in the tooth.

3. With a fine, tapering fissure bur, construct the female portion in the wax pattern of the bicuspid for the movable joint. This should be constructed parallel to the walls of the molar preparation. This can be done with the eye and need not be altogether accurate as the slot is made to diverge slightly gingivally-occlusally and disto-axially (Fig. 2, B). This indentation in the wax is more of a guide as the slot can be burred and polished to its final shape after the inlay is cast.

4. When the molar pattern is in place in the tooth, a slot is cut again, but this time the walls diverge occluso-gingivally and mesio-axially (Fig. 2, A). This need not be finished in the wax.

5. Cast the inlays in a hard, platinized gold and fit them to the teeth.

6. Finish the slot in the bicuspid casting, preferably with a tapered fissure bur. An inverted cone bur is useful in finishing the molar slot. The margins should be rough whereas the inside of the bicuspid slot should be smooth. It is good practice to round the inside angles of the bicuspid slot and to make those of the molar acute.

7. A wax bite is taken; an impression of the upper occluding teeth is made in compound, and an impression of the lower area is done in plaster. The inlays are seated in the plaster impression and the impression painted with separating medium. Do not paint the inlays.

8. Pour in Steele's[1] casting investment to about 5 mm. above the saddle area.

9. Adapt a piece of thin gauge tin foil to the surface of the investment and cover with remaining investment.

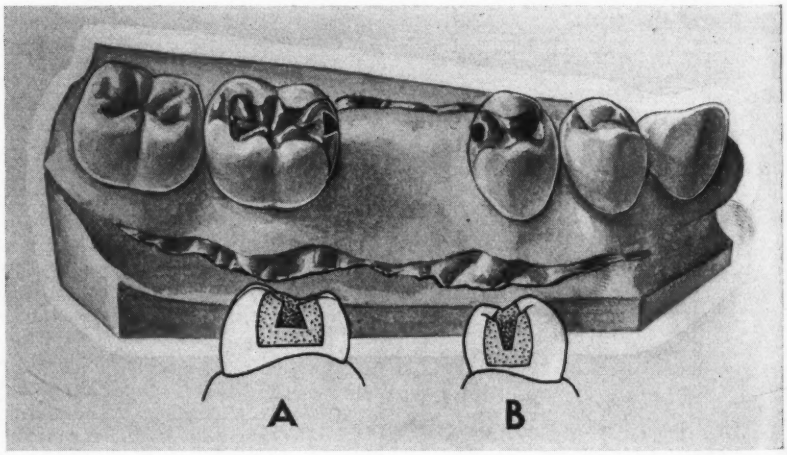


Fig. 2—Inlays in position with finished slots. A, Molar slot converges occlusally and is undercut slightly to axial wall and to buccal and lingual walls. B, Bicuspid slot diverges occlusally, allowing no undercuts. It is rounded, so that in the finished bridge the male portion will not be able to pull out distally.

10. Pour the upper occluding model in stone.

11. Mount the models on the articulator.

12. Select and grind Steele's trupontic to the edentulous area on the lower ridge.

13. Place, and hold in position by a template or sticky wax.

14. Oil the surface and lug slot of the trupontic and the bicuspid slot. Do not oil molar slot. Place the lug in the trupontic and build up the occlusal surface in wax, running the wax well into both bicuspid and molar slots. A true pattern will not be obtained if there is an excess of oil in the bicuspid slot. It is important that this bicuspid slot pattern be a true reproduction and have no discrepancies. Discrepancies may be prevented by heating a small pointed instrument and puddling it in the slot.

15. Carve the wax to occlusion (Fig. 3).

16. Place three sprues (Fig. 3), one from the area of the bicuspid slot, one from the molar slot, and one from the center of the pontic.

17. Remove the porcelain pontic; wet the model well, and paint investment over the molar and pontic to about 2 mm. distal of the bicuspid (Fig. 4). Allow to harden.

18. With a small saw or bur cut down lines A and B (Fig. 4) to the tin foil, and lift off the model. Note: The second molar is included.

19. Wet the model again and carefully paint the protruding pontic and wax male portion with investment.

20. Invest the whole in the casting ring.

21. Cast with the same highly platinized gold that was used for the inlays. The mold should be heated to a temperature that just eliminates the wax. Heating should not be done any longer than is necessary. In this way the copper in the investment material is not oxidized completely until the wax is eliminated. Fulfilling these conditions, it is possible to cast a lower fusing metal or a metal of the same

[1]Steele's investment is used because it incorporates some pure copper with the other ingredients. This takes up the sulphur from the plaster of Paris constituent of the investment and prevents its acting on the embedded metal. Thus any surface oxide is prevented and a strong homogeneous bond is formed when other metal is cast against the embedded metal.

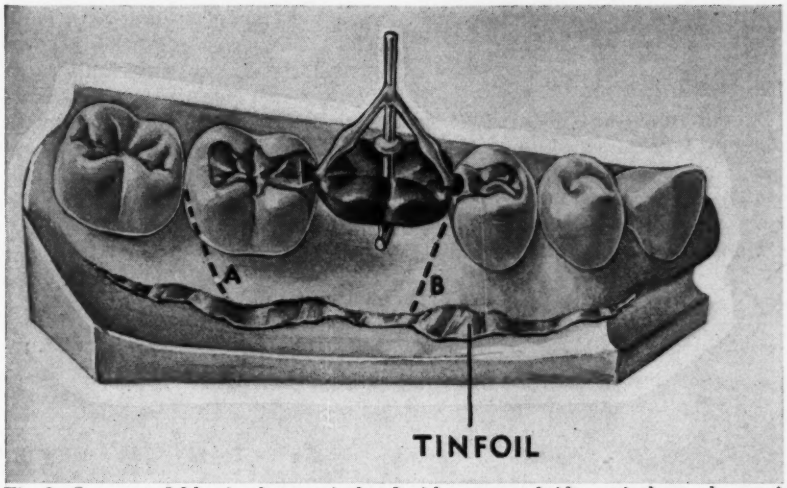


Fig. 3—Lower model having been articulated with upper on bridge articulator, the pontic is carved in wax over the porcelain trupontic. Wax is run in and puddled in molar slot. After bicuspid slot has been well oiled, wax is run in there and puddled. Male portion must be reproduced without discrepancies. Sprue pontic at three points, one in area of molar slot, one at bicuspid slot, and one in center. Tease out trupontic. Pencil lines show where model is to be cut down to tin foil after investment is run around pontic and second molar inlay.

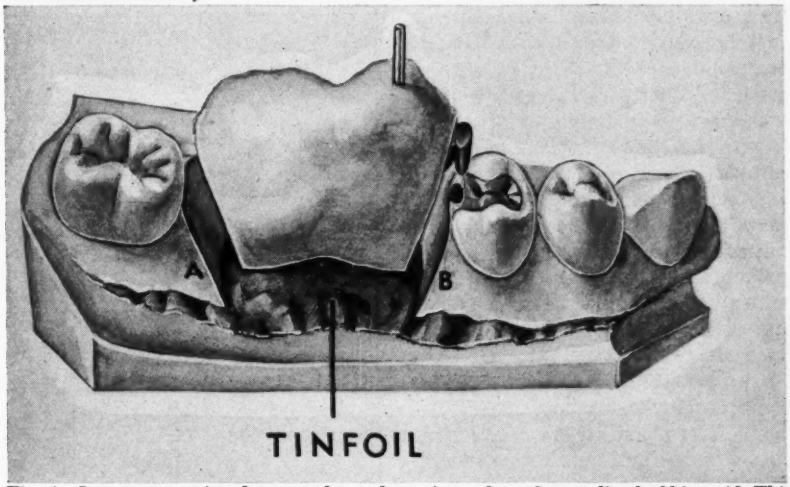


Fig. 4—Investment painted over molar and pontic to about 2 mm. distal of bicuspid. This allows opportunity to bur down to tin foil. By cutting down on converging lines from distal of second molar and distal of bicuspid to tin foil, invested portion is separated from remainder of model and wax male portion will easily slip out of bicuspid slot and be lifted off with remainder of invested portion. Wet the investment; paint remaining exposed part of pontic and wax male portion with more investment; invest in ring and cast.

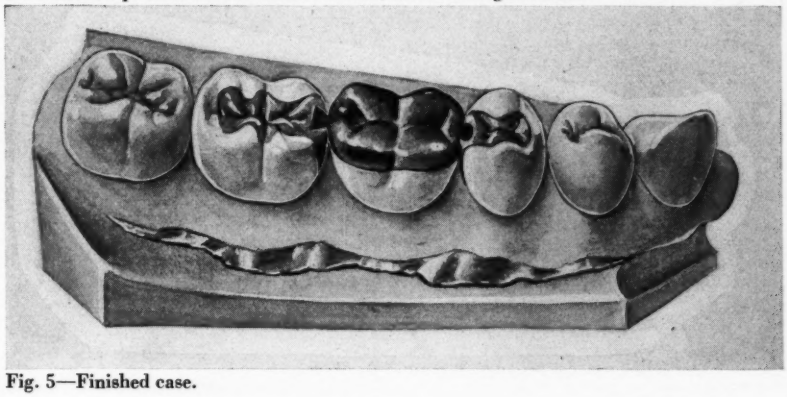


Fig. 5—Finished case.

fusing point as that embedded and obtain a satisfactory joint.

Conclusion

It will have been noted that two different type slots are employed. The molar inlay and the pontic are invested in one piece. When cast, the gold will flow into the undercut, occlusally, converging with the molar slot, and form a natural, tight joint. The undercuts will prevent any movement if, by chance, a perfectly fused joint is not obtained. The bicuspid slot, diverging occlusally, and with no undercuts, permits facile removal of the wax male portion (Fig. 5) and also provides a movable joint in the finished bridge.

Everything is run through on one model, the investment model. This minimizes the chance for inaccuracies. There is absolutely no soldering. When cast, the bridge is finished except for polishing. The highly platinized gold is used to insure hardness.

450 *Sutter Street.*

A Non-Clogging Saliva Ejector Pipe

C. FRANK TUMA, D.D.S., Cleveland

THE ORDINARY METAL saliva ejector pipe is likely to draw into it the soft tissues under the patient's tongue. With the inlet thus closed, a greater vacuum is immediately created. The tissues are then drawn more tightly into the openings of the ejector pipe and can be released only after unnecessary pain has been caused the patient. This distress can be entirely prevented by fitting the ejector pipe with an auxiliary air inlet which eliminates the building up of an excessive vacuum, yet does not interfere with its proper functioning nor mar its appearance. The accompanying illustrations demonstrate how easily this may be accomplished.

13201 *Miles Avenue.*

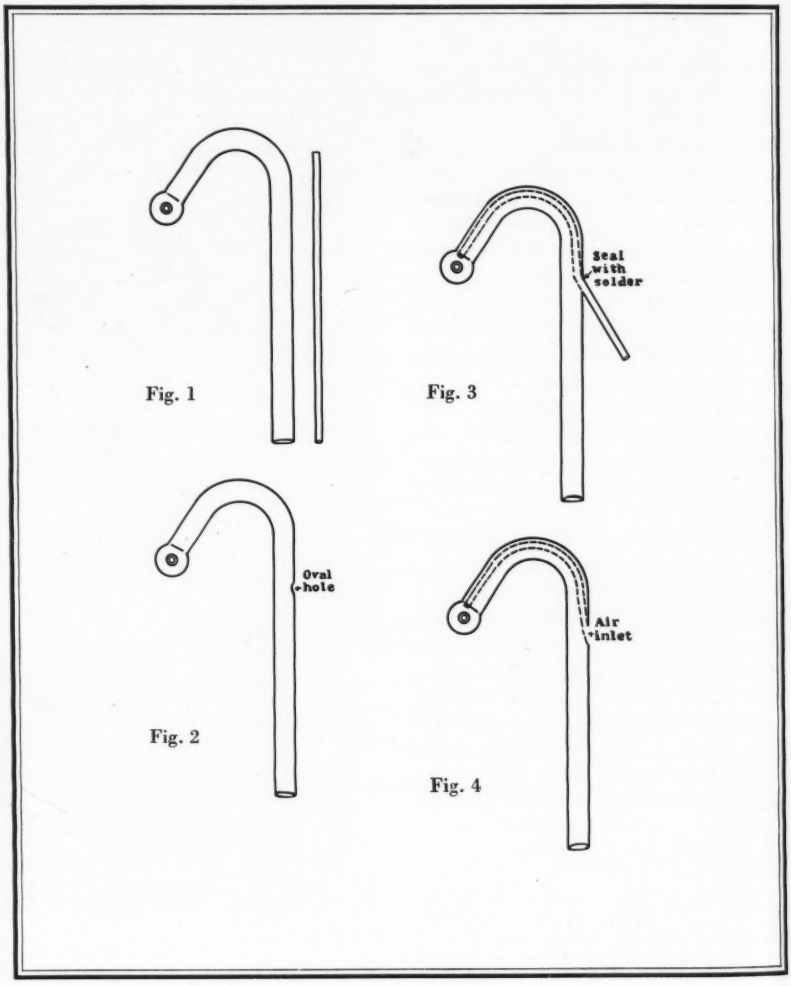


Fig. 1

Fig. 3

Fig. 2

Fig. 4

Fig. 1—An ordinary saliva ejector pipe and a short length of copper tubing with an inside diameter from 1 mm. to 1.5 mm.

Fig. 2—Drill a hole in the stem opposite the inlet, large enough to admit the small auxiliary tube. Enlarge the hole to an oval outline to permit easier insertion of this small tube which is to serve as an auxiliary inlet for air.

Fig. 3—Insert the small auxiliary tube; work it around the bend inside the ejector pipe until it comes to a stop in the bulbous inlet. Withdraw it 2 mm. or 3 mm. Solder with ordinary soft or lead-tin solder to seal the joint.

Fig. 4—Saw off the excess small tubing and polish flush with the surface, leaving the auxiliary air inlet tube concealed within the ejector pipe.

What Interproximal Examination Reveals

ROBERT M. REED, D.D.S., Faribault, Minnesota

EVERYONE WILL ADMIT that with good light, mirrors, and sharp explorers, the majority of cavities will be detected, but not until they are rather large. It should be borne in mind that there are sixty contact points and their proximal surfaces, which make difficult the early detection of caries by any other means than that of bite-wing roentgenograms.

Advantages

1. The use of bite-wing films are essential to the practice of preventive dentistry.
2. Dentists cannot honestly tell patients that their mouths are free from caries or periodontal lesions unless bite-wing films are employed.
3. Dentists are not fair to themselves if undiscovered cavities result in discomfort or acute pulpitis before the patient's next visit. The patient may react unfavorably toward the dentist.
4. Misunderstandings are unfortunate, and I have found that they are usually entirely unnecessary. The replacement of old restorations is often such a source of difficulty. If patients can see these needs: leaky amalgams; failing bridge abutments, for example, they are not only willing, but anxious and happy to have them replaced. I have found, too, that patients usually want something better than was used for the original restoration.

Some typical examples of these faults are shown in the accompanying roentgenograms. Every one of the areas shown are potential sources of infection. These would, to be sure, have been revealed in a periapical examination; but I have had patients refuse to permit a full mouth roentgenographic examination but willingly permitted interproximal examination with its commensurate fee. Frequently after a demonstration of the oral conditions seen in the bite-wing roentgenograms, patients are willing to have full mouth roentgenograms taken when these are indi-

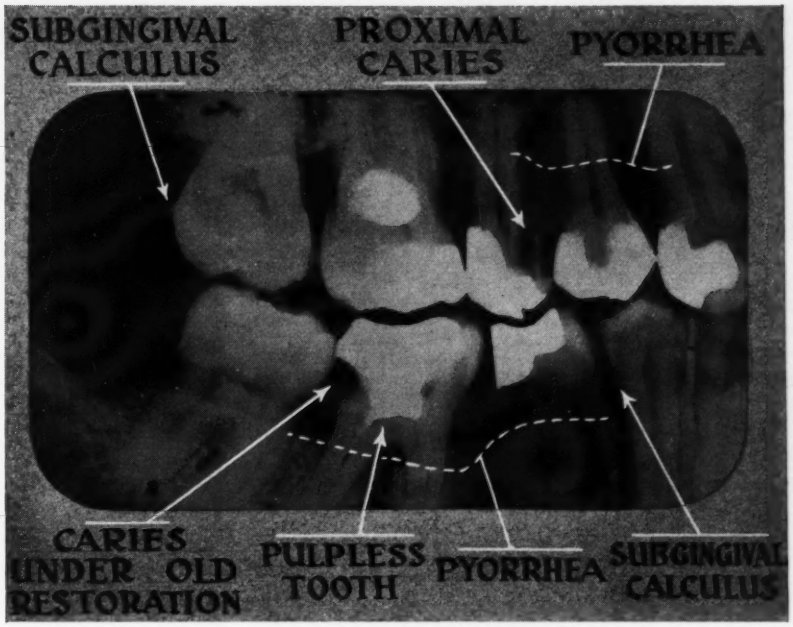


Fig. 1

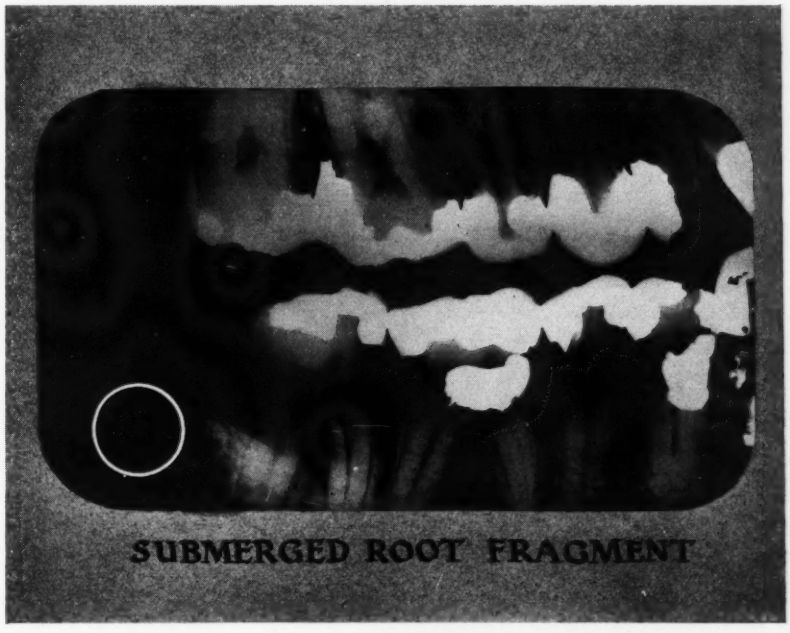
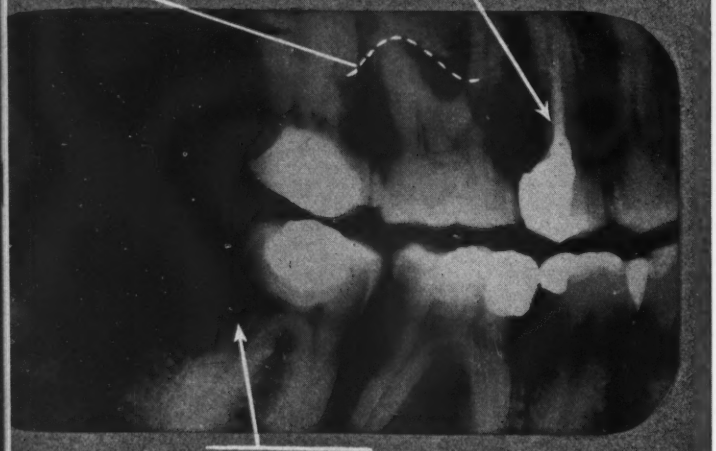


Fig. 2

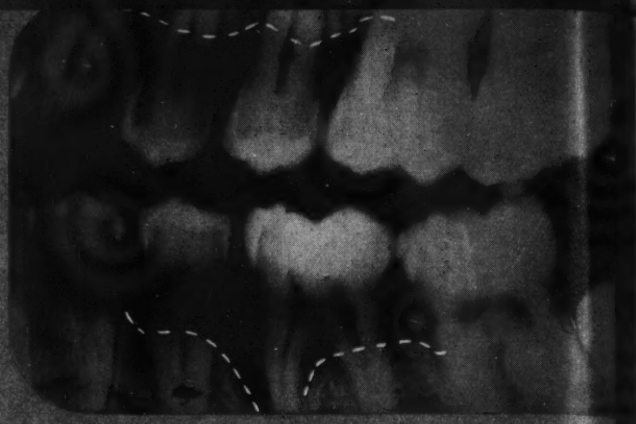
PYORRHEA POCKET

PULPLESS TOOTH

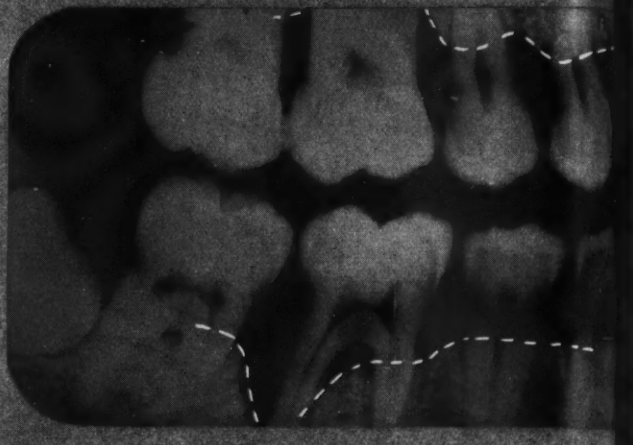


GINGIVAL CARIES

3



BONE DESTRUCTION OF PYORR



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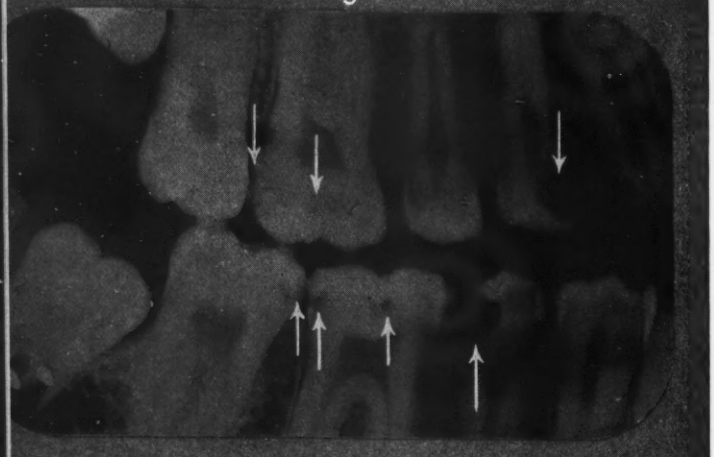
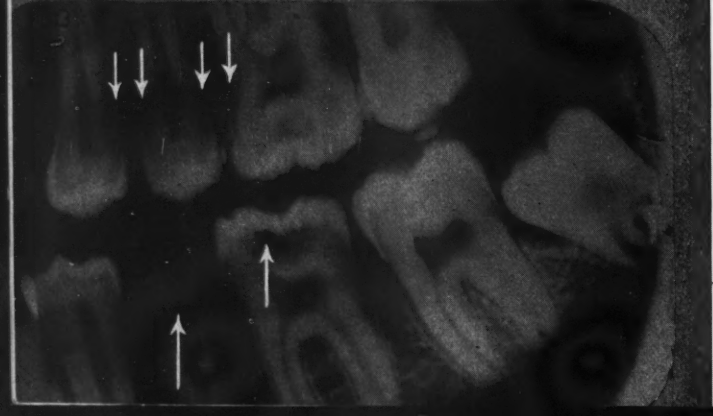


STAGES OF DENTAL CARIES



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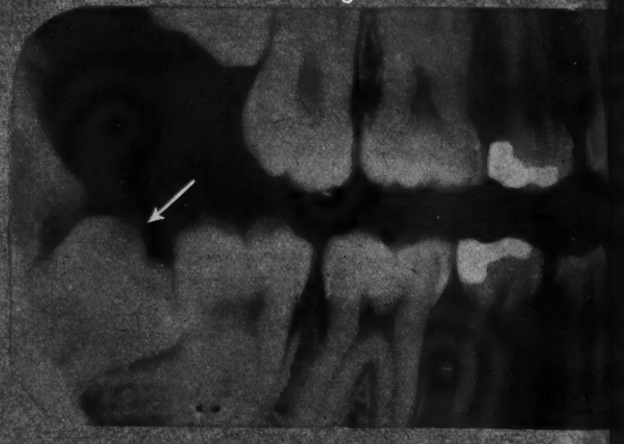
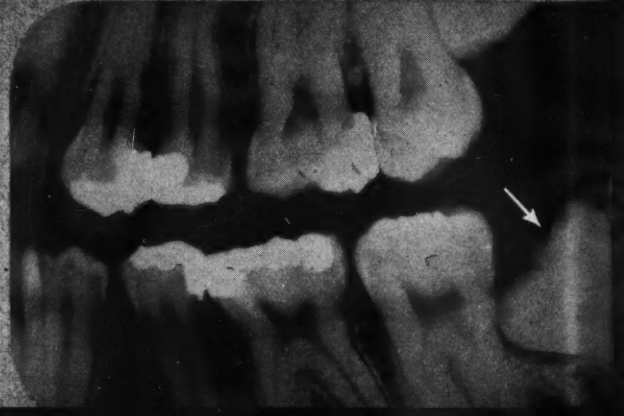


IMPACTED TEETH



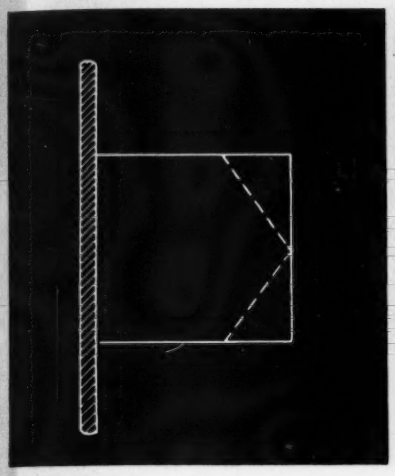


Fig. 7

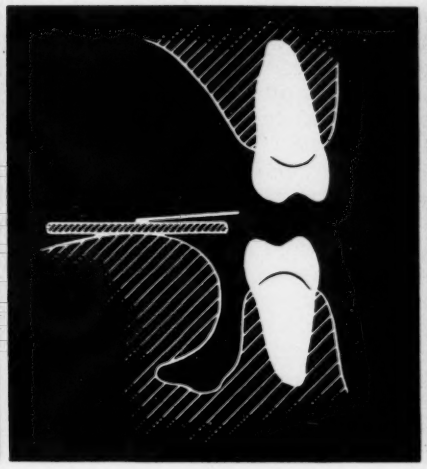


Fig. 8

Fig. 9

Fig. 7—Trim bite-tab with a pair of scissors. This allows for closer adaptation of the cone and the cheek, without disturbing the film. A neat way to check children's mouths which are too small to allow the use of the regular bite-wing is to remove the tab from a number 1 film, and use a little adhesive tape or simply hold it with a little dental floss, in the same position employed for numbers 2 or 3 films in an adult's mouth.

Figs. 8 and 9—1. To place the film, for example, on the left side, hold the film in the right hand with the bite-tab uppermost, introduce it into the mouth so that it lies almost on the tongue with the tab flat against the film.

2. Gently slide the film toward the left, carrying the edge down between the tongue and gums. The tab will then extend out over the occlusal surfaces of the lower teeth.

3. With foil carriers grasp the tab and ask the patient to close together slowly. This will permit the film to be brought into the desired position without having the edges cut into the tender oral tissues. Be careful not to pull the film up too tightly against the teeth. To do so would bend it, with resultant distortion of the images. Caution patient to be quiet; not to swallow, and to breathe through the nose.

cated. This aid in diagnosis, moreover, makes it possible to estimate the fee and make definite arrangements for handling the account in advance of services rather than at completion.

5. Bite-wing films, I believe, serve as a stimulus to better dental service. Overhanging margins are readily seen and prevented. Contact points are improved, with the resulting health of the gingival tissue. Patients are quick to grasp the difference between nicely

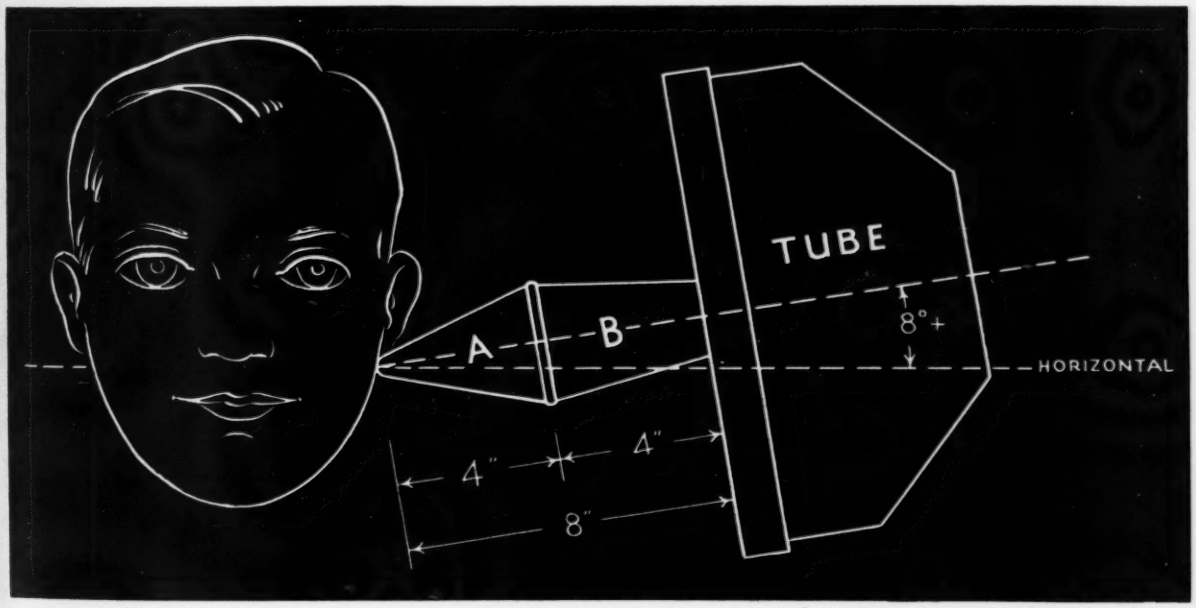


Fig. 10

Fig. 10—Doubling of exposure time was accomplished on my machine by adding a four-inch cone to the four-inch funnel-shaped ray-director, with which my x-ray unit was originally equipped. A, cone; B, funnel. This gives an eight-inch target distance.

Inasmuch as all bite-wings are of the regular emulsion, I double the exposure time previously used. If I used nine seconds before adding the cone, for example, I would now use eighteen seconds. I use this attachment for all roentgenography, doubling whatever may be the correct exposure time for the type of film used and whatever area is to be exposed.

finished restorations and those not so well made. It is worth while to spend some time educating patients with some typical roentgenograms. I use to good advantage the colored chart of Charles F. Bodecker of Columbia University, showing enamel fissure decay. It fits in well with explanation of the bite-wings shown in the shadow box. Sometimes it is advantageous to give a skeptical patient a hand mirror and let him watch when an enamel margin is removed to expose a large proximal cavity.

Technique

Films—In all dentistry there is no technique simpler than that required for making interproximal examination. In many cases all that will be required will be bite-wings of the posterior teeth. To check the entire mouth, five bite-wing films are required, three anteriors and two posteriors. The latter are number 2 or 3, depending on the anteroposterior length of the mouth. I use Eastman bite-wing films. These are supplied in packets and have a bite-tab, on which the patient bites in normal occlusion to hold the packet in place.

Positioning of Patient—The position of the patient is the same as for taking roentgenograms of the maxillary teeth; that is, with the occlusal surfaces parallel with the horizontal.

Placement—The placement of the packet is not difficult but can be uncomfortable to the patient, unless carefully handled. It is nearly always necessary to relieve or bend the corners slightly.

Exposure Time—Allowance must be made for the correct exposure time, which for children is about one-half to one-third that used for adults (Fig. 8). This will permit the finding of these proximal cavities at a time when it is not too difficult to have them restored.

Angulation—The correct angulation is that which directs the central ray at right angles to the film surface. In most cases 8 degrees above horizontal will be suitable. This may be either higher or lower, according to the lingual or buccal inclination of the teeth. The horizontal angle for the molar region should parallel the mesial surface of the lower first molars.

This is Clarence O. Simpson's technique for roentgenographic exposure. It provides films of outstanding brilliance and contrast. It is simple and effective. It consists, basically, of doubling the exposure distance; hence, doubling the exposure time (Fig. 10).

Processing; Fixing; Washing — Process in the regular way, five minutes at 65 degrees, fix for ten minutes, and wash for at least thirty minutes in running water.

Conclusion

The crown portion of the upper and lower teeth of any given area will be recorded by this technique without distortion, on the same film. The bite-wing film is superior to the periapical film for this purpose because of the low vertical angle used, which permits the rays to pass directly through the enamel cap, gingival areas, and the coronal portion of the root. Areas are thus revealed which are obscured by the high vertical angle used in the periapical examination. Few periapical roentgenograms would actually be needed, if at regular intervals of one or two years, patients' mouths were checked with bite-wing films. Cavities would then be detected in their earliest stages. This means small restorations; less pain and discomfort to the patient.

414-A *Central Avenue, N.*

EXAMINATION FOR APPOINTMENT IN THE DENTAL CORPS OF THE NAVY

A competitive examination to select not more than twenty for appointment in the Dental Corps of the Navy will be held on July 5, 1938, at the Naval Medical School, Washington, D. C., Naval Training Station, Great Lakes, Ill., and Naval Training Station, San Diego, Calif.

A candidate for appointment in the Dental Corps must be a citizen of the United States, and must be between 21 and 32 years of age at the time of appointment, a graduate of a standard dental college, of good moral character, and of unquestionable professional repute.

Credentials relative to character, citizenship, date of birth, and education must be submitted and approved before an applicant can be authorized to appear for examination.

A circular which contains full information relative to the Dental Corps and describes the method of making application for appointment, may be obtained from the Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

Incision for Drainage of Well Circumscribed Alveolar Abscess

BERNARD P. MORGENSTERN, D.D.S., M.D., New York

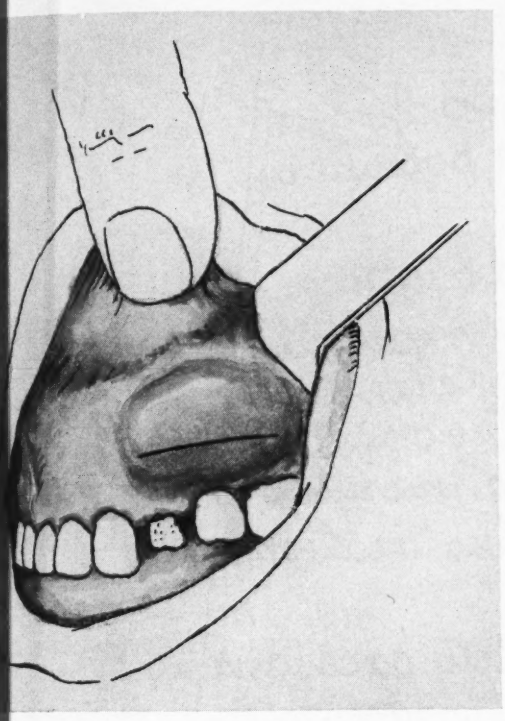


Fig. 1 (left)—Usual type of incision for alveolar abscess.

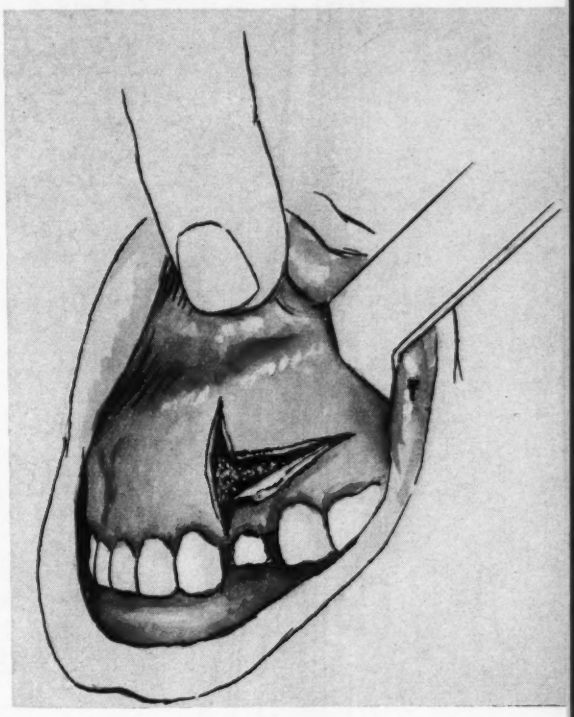


Fig. 2 (right)—Subsequent incision for operation showing tear through old incision.

IN MAKING THE USUAL type of incision for an alveolar abscess (Fig. 1) and the subsequent incision necessary for operation, the flap often tears (Fig. 2). Difficulty is therefore encountered in suturing, and in healing of the wound. Sloughing of the flap may occur.

If the incision is planned for the drainage of the abscess in such a way that the same incision can be utilized for the subsequent operation, these difficulties will be obviated. This type of incision is not recommended in deep-seated abscesses but in small, well localized abscesses in the mucobuccal fold and below.

240 *East Seventy-Ninth Street.*

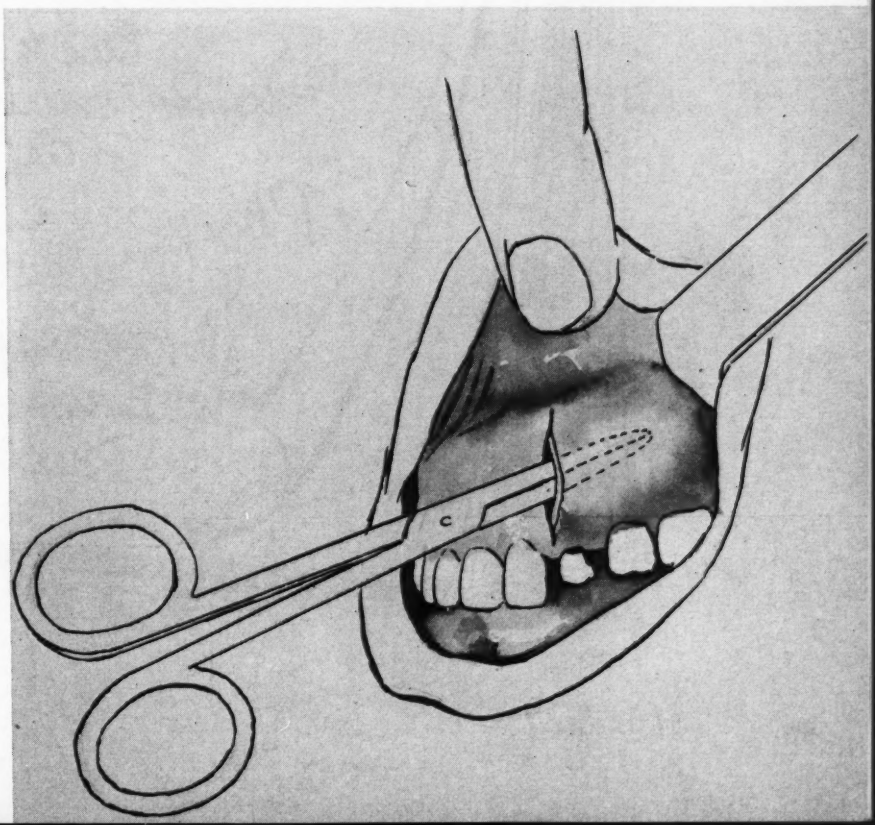
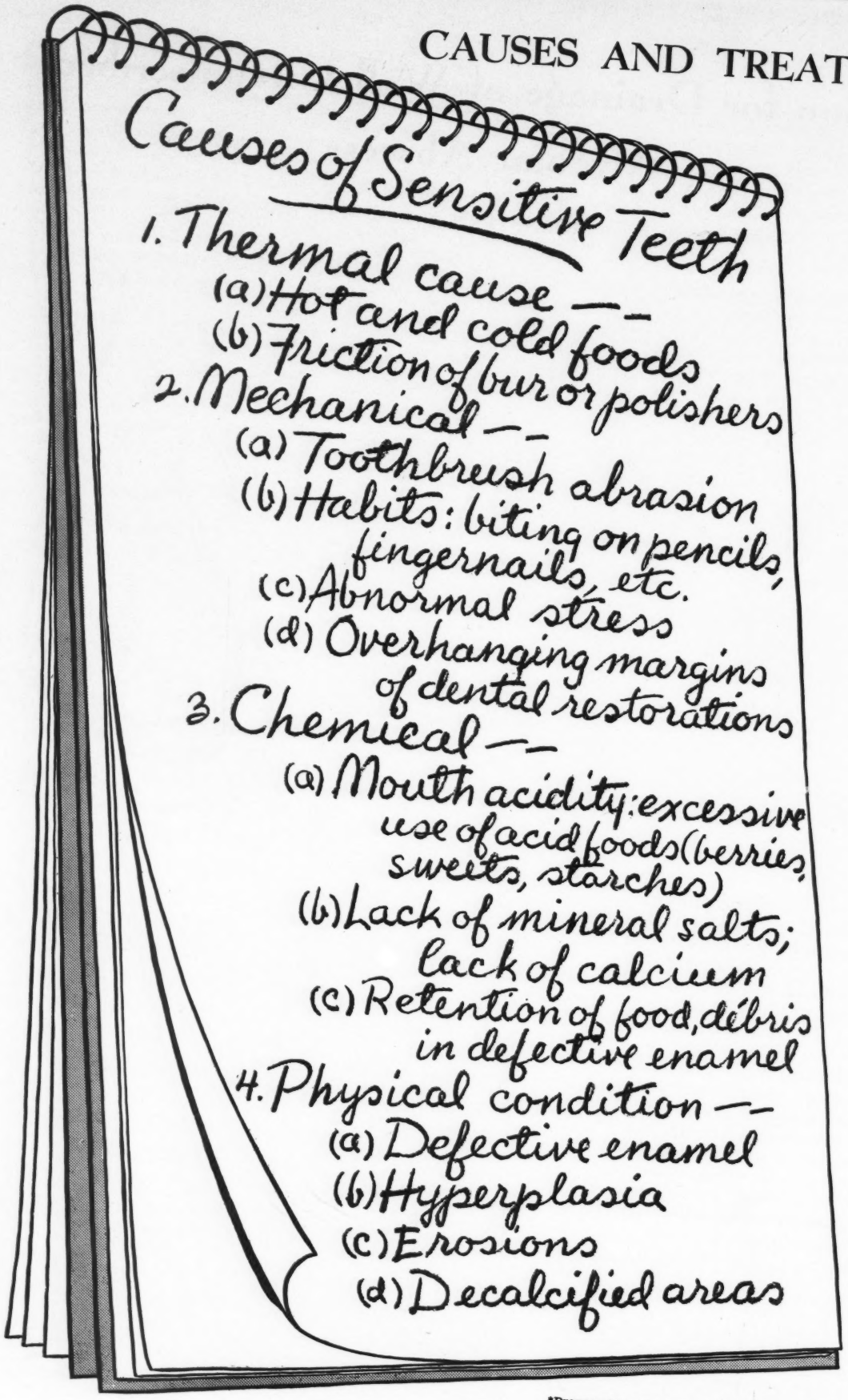


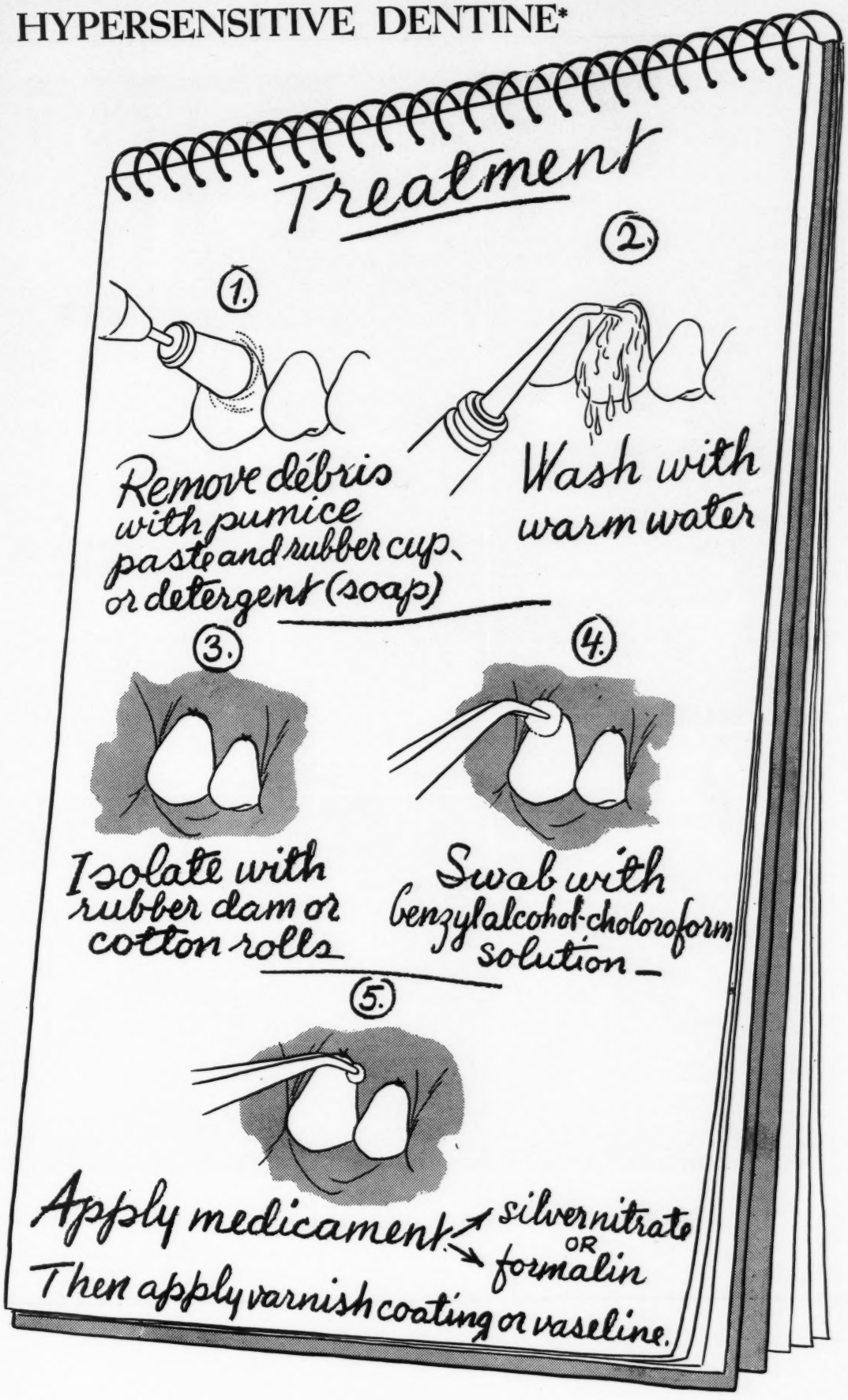
Fig. 3—Incision made as for contemplated operation. Clamp inserted into abscess cavity; pus evacuated. Same incision can be utilized for subsequent operation.

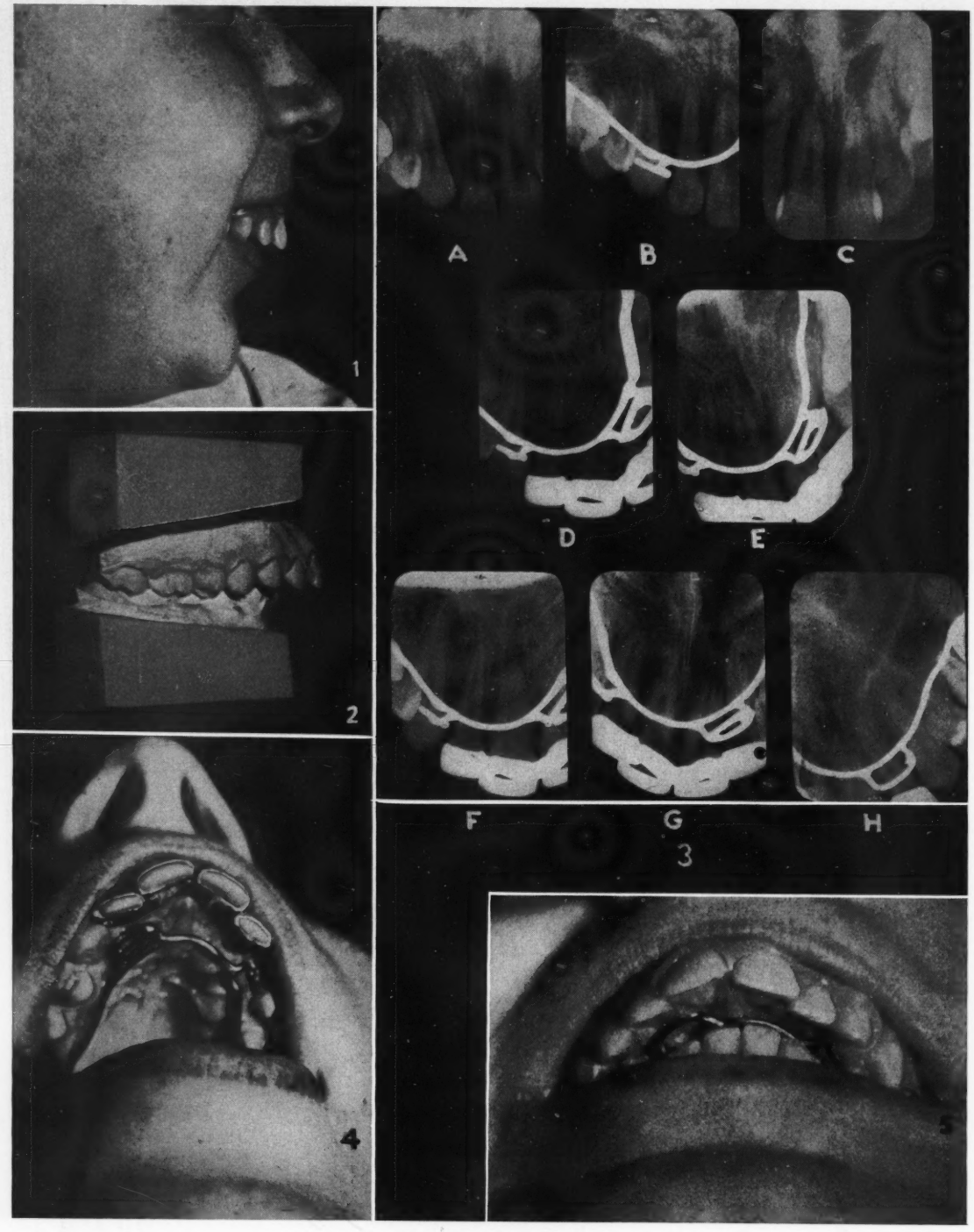
CAUSES AND TREATMENT


Causes of Sensitive Teeth
1. Thermal cause —
(a) Hot and cold foods
(b) Friction of bur or polishers
2. Mechanical —
(a) Toothbrush abrasion
(b) Habits: biting on pencils, fingernails, etc.
(c) Abnormal stress
(d) Overhanging margins of dental restorations
3. Chemical —
(a) Mouth acidity: excessive use of acid foods (berries, sweets, starches)
(b) Lack of mineral salts; lack of calcium
(c) Retention of food, débris in defective enamel
4. Physical condition —
(a) Defective enamel
(b) Hyperplasia
(c) Erosions
(d) Decalcified areas

*Prepared by the Editorial Staff of THE DENTAL DIGEST from the article by Louis I. Grossman: The Treatment of Hypersensitive Dentine, J. A. D. A. 21:2005 (November) 1934 and adapted in THE DENTAL DIGEST, 41:130 (April) 1935.

OF HYPERSENSITIVE DENTINE*





Legends on opposite page

Alveolar Destruction Due to Traumatic Malocclusion

MEYER COHEN, D.D.S., Brooklyn, New York

A BOY, AGED 13 YEARS, was referred for orthodontia. The patient had a marked protruding upper dentition; that is, an Angle Class 2 malocclusion (Fig. 1). The lower anterior teeth left deep indentations in the palate posterior to the upper incisive region. The lingual surfaces of the upper right bicuspids occluded with the buccal surfaces of the right lower bicuspids (Fig. 2). This contributed to the loss in vertical dimension and to the degree of overbite.

History—The patient had fallen at the ages of 5 and 8 years and injured the anterior teeth. It cannot be determined, however, to what extent, if any, the injury had contributed to the loss of alveolar process. From time to time, for a period of two years, pus would drain from a fistula posterior to the upper left lateral midway between the apex and the gingival margin. This condition was present on November 30, 1936, when the patient was referred.

Examination—The lips and cheek were swollen; the upper left central and lateral were loose. Roentgenograms of the upper left central, lateral, and cuspid showed considerable infection and marked loss of the alveolar bone extending to the apical third of the cuspid and involving the apexes of the central and lateral (Fig. 3, a and b). The teeth were vital to the pulp tester.

Diagnosis—It was suggested that an oral surgeon be consulted. The patient was taken to Doctor Harry Seldin who diagnosed the case as a lateral alveolar abscess or the destruction of the alveolar bone as a result of trauma and periodontal infection. The pulps were vital.

Etiology—Progressive chronic traumatism was due to the patient's malocclusion. Infection of the periodontal tissue was due to the lowered resistance of the periodontal tissue. It is believed that the injury sustained when the child fell had no bearing on the case, inasmuch as the teeth were vital for a number of years.

Treatment—Doctor Seldin advised immobilization of the teeth in question; relief of the traumatism, and surgical intervention by incision and insertion of a drain to relieve the acute symptoms before surgical removal of the infected tissue.

Orthodontic Treatment

A soldered, lingual, 18 gauge, fixed wire appliance was constructed. It was used as a temporary expedient, and not to move the mandible forward to correct the malocclusion. The appliance was flexible and stable, not rigid. It did not exert any undue stress upon the molars that anchored it or upon the right upper cuspid and lateral, or the left upper cuspid which supported it anteriorly (Figs. 4 and 5).

The bite was opened enough to prevent the lower anteriors from sinking into the palate. The appliance was also so constructed that in any for-

Fig. 1—Lateral view; pronounced protrusion of upper dentition.

Fig. 2—Models illustrating marked overbite accentuated by occluding of lingual surfaces of upper right bicuspids with the buccal surfaces of lower right bicuspids.

Fig. 3—a, Preoperative roentgenogram showing extensive destruction of alveolar process about the upper left cuspid, lateral, and central; b, soldered lingual appliance in position to relieve injury to tissue caused by malocclusion; c, preoperative roentgenogram showing extension of destruction of alveolar process to upper left and right centrals; d, postoperative roentgenogram showing regeneration of alveolar process about six weeks after treatment; e, postoperative roentgenogram seven weeks after treatment; f, g, and h, extent of bone regeneration about ten weeks after surgical and orthodontic intervention.

Fig. 4—Photograph illustrating the four-band soldered splint and soldered lingual appliance to relieve tissues of injury caused by lower anterior teeth sinking into palate.

Fig. 5—Photograph illustrating utility of temporary appliance in mastication and in tissue protection.

Fig. 6—Front view of splint cemented into position.

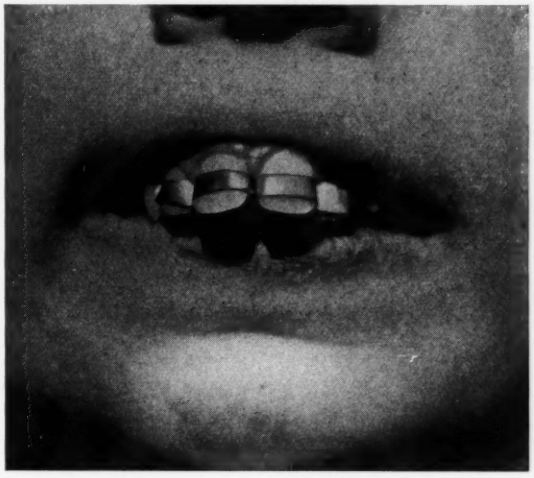


Fig. 6

ward movement of the mandible there was complete contact between the lower anteriors and either the appliance or the upper anteriors.

Cod liver oil was prescribed to be taken daily. Several Rogers' muscular exercises were taught the boy.

The upper centrals and laterals were banded individually and soldered into a single splint. This was cemented into position (Fig. 6). The bands were constructed so as not to impinge even slightly upon the gingivae. The teeth having been thus splinted and the appliance placed in position, the patient was referred to Doctor Seldin for surgery.

Surgical Treatment

Under nitrous oxide-oxygen anesthesia, Doctor Seldin retracted the mucoperiosteum and curetted the infected granulation tissue and necrotic alveolar bone. The alveolar process, extending almost to the apexes of the left central and lateral, was found to be destroyed. When the infected tissue was removed, the left central and lateral seemed to have no support left and were held in place apparently by the splint. The mucoperiosteum was then sutured in position. The child received postoperative treatment for a period of two weeks, the sutures having been removed at the end of five days. He made an uneventful recovery with a gradual and surprisingly rapid regeneration of the alveolar process.

Results

According to the roentgenograms, regeneration seems to have been completed in less than four months. All the teeth have remained vital. Fig. 3, b shows the teeth with the appliance but before they were banded for the ensuing operation on November 30, 1936. Fig. 3, d (February 13, 1937) shows the filling in of new bone. Fig. 3, e shows the condition on February 20, and Fig. 3, f, g, and h (March 13) shows marked regeneration of bone. Fig. 3, h represents the upper right anterior and bicuspid sections. The lamina dura and periodontal membrane of each tooth as well as the septal crests of the alveolar process appear normal and sound.

Conclusion

Cooperation between the general dental practitioner, the orthodontist, and oral surgeon in this instance proved of advantage to the patient. The anterior teeth were saved and subsequent orthodontic procedure was thus made possible.

253 *Crescent Street.*

Announcement of Books Received

STUDIES IN DENTAL PROSTHETICS, Volume 1, Text; Volume 2, Illustrations, By G. Y. Hildebrand, Stockholm, Swedish Dental Association, 1937.

MAN, BREAD AND DESTINY (*The Story of Man and His Food*), By C. C. Furnas and S. M. Furnas, New York, Reynal & Hitchcock, 1937.

SPEECH TRAINING FOR CLEFT PALATE PATIENTS, By H. P. Pickerill, Christchurch, New Zealand, Whitcombe and Tombs Limited, 1937.

DIE ZAHNKARIES DER GOMSERKINDER (Illustrated), By Adolf Roos, Buchdruckerei Berichthaus, Zurich, 1937.

THE STORY OF VITAMIN B_1 (Illustrated), Compiled By C. R. Addinall, Ph.D., Rahway, New Jersey, Merck & Co., Inc., 1937.

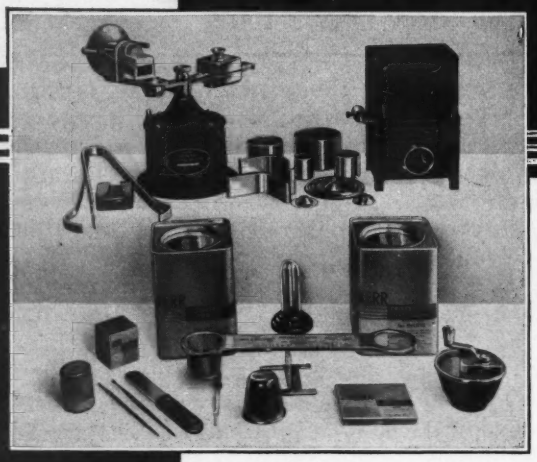
The Editor's Page

AN EMINENT DENTAL specialist writes that he is perturbed because many of his colleagues have been referring patients to him "with strings attached." This man does not object to doing his share of free consultation and his record proves that he is generous in giving clinics before professional groups. Dentists from various parts of the country come to him at their convenience, take up a great deal of his time in conference, or bring him patients for diagnosis and treatment-planning for which he receives no compensation. The kind of service this man performs is of a highly developed technical nature, which few could learn without spending months in studious application.

When a dentist comes across a case requiring extensive occlusal reconstruction or oral surgical intervention; for skillful orthodontic care; for the correction of cleft palate by prosthetic methods—then, it is not enough for him merely to seek a quick consultation with a specialist and plunge into treatment himself. The temptation is sometimes strong to risk forms of treatment in fields in which we are not well qualified. It is obviously unfair for a patient to have inexperienced service when expert attention can be made available. On that, we are agreed. I doubt very much, however, if we have given enough thought to our unfairness to specialists. Under what conditions do we refer patients to specialists? Usually when we feel that someone else is better qualified to do a particular service. If that is true, the fair statement to the patient is just that. Tell patients that there are other people, better qualified than we are in a specific field, who can do the job better. We cannot expect to elevate ourselves in the eye of the public by referring patients with either direct or implied depreciation of specialists. In every vocation we have accepted the fact that some people are better qualified to perform certain tasks than others. To prejudge a case before referring is likewise unfair to the specialist. For example, to refer a difficult case of extraction with the optimistic aside that it is an "easy extraction," or, to refer a case of malocclusion with the pessimistic declaration that it will cost a lot of money—these are not helpful introductions to specialized service. The system of referring patients, without attaching any strings, to specialists in required fields, in no way detracts from the status or importance of the general practitioner but rather is another application of private group practice. Private group practice is naturally best accomplished in centralized clinics. Lacking the facilities for an adequate and universal centralized clinic system, out and out referrals in which general practitioners and specialists cooperate ethically and not begrudgingly can be made an effective and successful form of practice. This is the way to insure adequate care to patients and drown some of the cries for state medicine.

Some reviewers have accused Doctor Cronin of writing a brief for health insurance in his controversial book, *The Citadel.* Physicians have said he is a traitor to his guild in exposing the evils within medical practice. But the author apparently is honest in hating hypocrisy either at the lowest level of medical life or at the highest. He has shown a dour picture of health insurance in action, controlled by laymen, overshadowed by bureaucracy. At the other pole, he has allowed us to peer into the consulting rooms of Harley Street where the "Charm School of Medical Practice" operates. If the author is trying to argue a case at all, it is probably the case of private group practice. Here are his own words:

"Group medicine is the answer, the perfect answer. It comes between state medicine and isolated, individual effort." The author cites particularly the success of the Mayo Clinic and other group clinics in the United States. Cronin is certainly intolerant of the medical Bourbons and the politicians. He declares himself without ambiguity, it seems to me, in favor of: "A new interpretation of the Hippocratic oath; an absolute allegiance to the scientific ideal, no empiricism, no shoddy methods, no stock prescribing, no fee-snatching, no proprietary muck, no soft-soaping of hypochondriacs." And again, "There ought to be a law to make doctors keep up-to-date. It's the fault of our rotten system. There ought to be compulsory post-graduate classes, to be taken every five years." These quotations do not advocate state medicine; nor have I been able to find any that do. Group practice does not mean state medicine. Cronin advocates medical reform, not revolution.



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NOTES ON THE *Cuff*

Dec. 21—Death in the hallway. "I'll never resist a holdup man with a gun," a dental gold salesman remarked. So the bandit who led him to the third floor of an office building in Rockford, Illinois, probably found Benjamin Mullen an "easy mark." The third floor was vacant and it was dark and there the bandit manacled the gold salesman with handcuffs to a seat and taped his mouth and taped his eyes. And the bandit took the little black satchel with a couple of thousand dollars of gold. A dentist on the floor below heard moans; he found the gagged and tied salesman in the dark of the hallway. Without removing the gag the dentist called the police. They came, and they saw a dim figure who could not raise his hands at a command, who could not answer back, but they did not know this and they shot him. The salesman died with a bullet in his spine. The quick-shooting policeman went free. The bandit has not been found. Benjamin Mullen was buried on the third anniversary of his wedding.

Dec. 23—Of the many tribulations of an editor, not the least is the army of inventors, discoverers, and self-acclaimers. Then there are the cryptic folk who have something but they can't quite explain or tell what it is. Still another group would include those who claim priority for something that somebody else has published. In dealing with inventors and discoverers, particular patience is required, because it is sometimes difficult to distinguish on first encounter between a psychopath and someone who may have something on the ball. The cryptic regiment is the most irritating. They have discovered, so they say, the specific cause of dental caries, a new anesthetic agent that is as simple of induction as lighting a cigaret. When one tries to obtain the exact information from these people, he finds that they are usually evasive, afraid their secret is being ferreted out for exploitation. Sometimes they

(*Continued on page* 81)

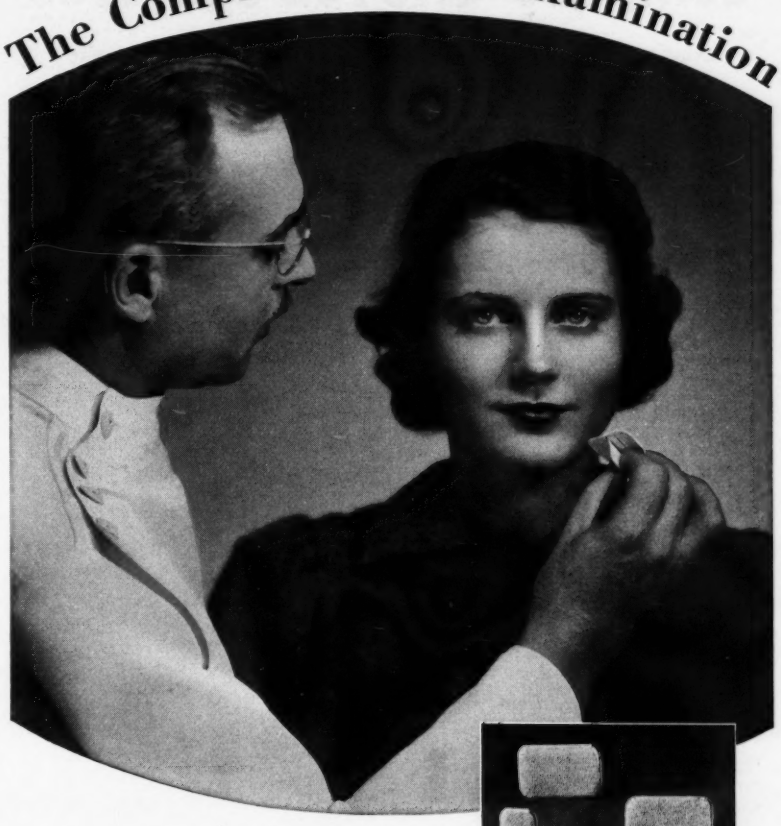
grow insulting because concrete evidence is sought. Their word in having discovered a panacea should be sufficient. They are not appreciated. The world knows them not. And sometimes an expression of interest in their cryptic message elicits a sales talk for some mysterious concoction. We are speaking of dentists here, not promoters.

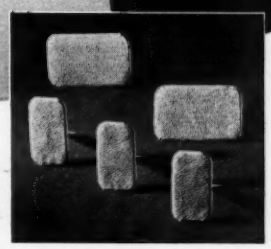
The priority racket works this way: A man publishes an article in a professional journal and immediately somebody writes in to say that he had that idea way back in 1907 or maybe it was during the Spanish American War. The answer is that ideas are not patentable. If you have something worth while, you had better get into print, or somebody else will.

Jan. 3—Lord Bryce in his AMERICAN COMMONWEALTH has set the standard for a clear description of the American government. The question we can ask ourselves is, "How democratic is democracy?" A lawyer-friend comments on the hierarchy of the Bar Association. Is there a hierarchy in dental organizations? How well is the rank and file opinion of dentists expressed in the councils of the American Dental Association? In how many states are delegates to the American Dental Association convention elected by the members direct, or is the selection by boards of directors or executive councils? Is there any provision for suffrage in your state dental association wherein if you are not in attendance at the annual state meeting, you have a voice and a vote in the selection of delegates to the national meeting? Whenever representatives are not elected by direct vote, democratic institutions are imperiled. Years ago, we did away with the election of United States Senators by state legislatures. It seems time that in every state, delegates to our own dental congress should be elected by direct vote.

Jan. 5—A penny post card from a dentist in Brooklyn. He doesn't like this magazine. In fact, he thinks it is terrible. The editorials, particularly, are dumb. For two dollars a year and through the mails, he only wants a few things: a course in denture construction; complete information on inlay technique; the details of porcelain jacket crown construction; activities of dental societies in matters pertaining to clinics; all the fine points of local and general anesthesia; the details of surgery for the

The Complete Dental Examination





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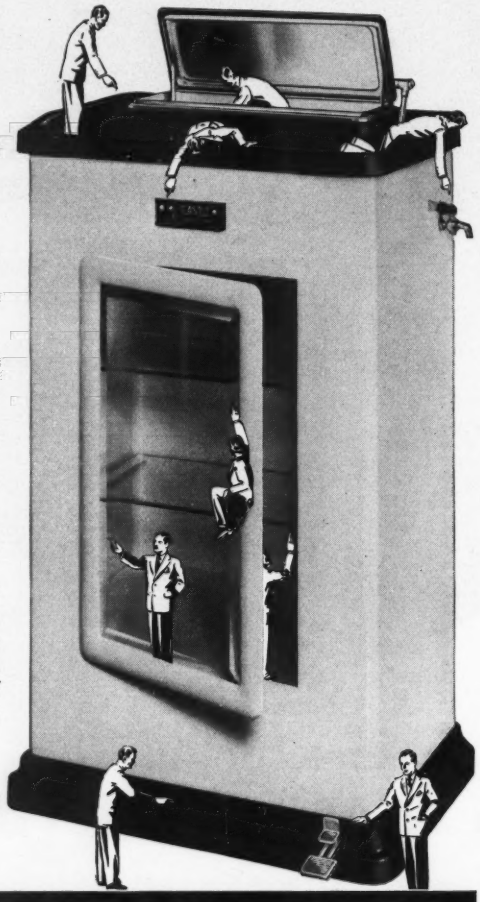

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general practitioner. After all, a dental magazine is not a dental correspondence college.

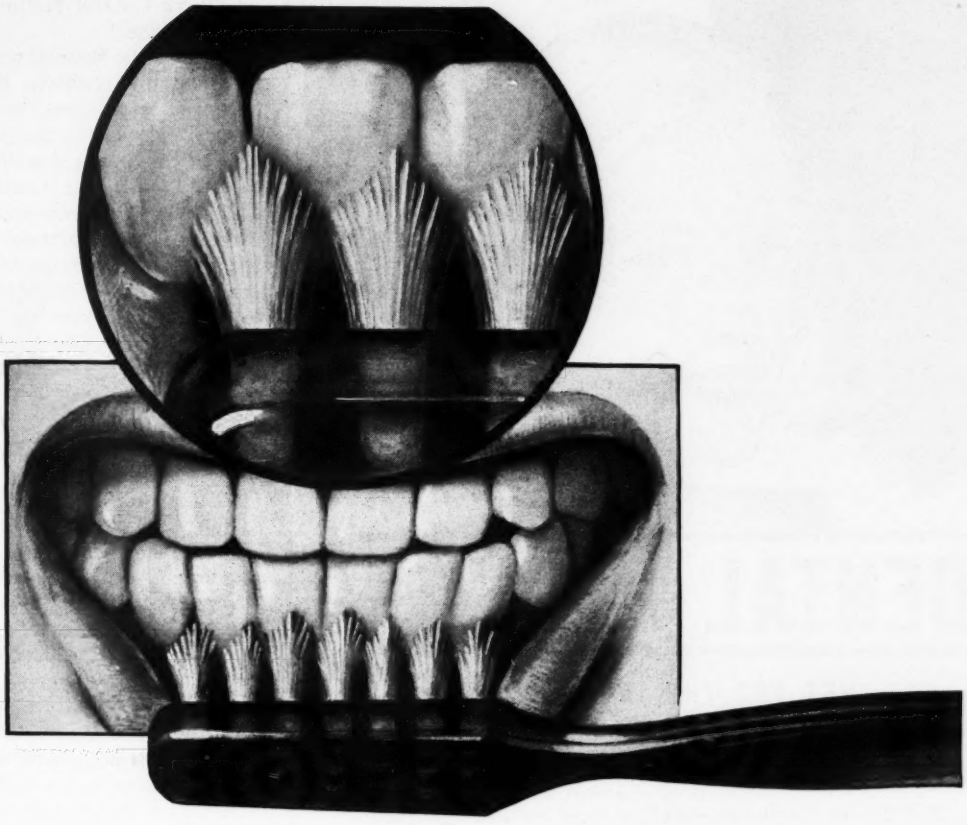
Jan. 7—That thick gray haze that hangs over a dental meeting is, in fact, nicotine, pyridine, carbon monoxide, various aldehydes, hydrocyanic acid, methyl alcohol, a volatile oil, and a small amount of arsenic. If you think it does you any good to chop your way through this haze, you might read the articles by Chapman and Minnhaar as reviewed in the *Journal of the American Medical Association* of January first. The next time you reach for a cigaret at a dental meeting, remember the exhortations of these investigators: that smoke obstructs the flow of blood through the blood vessels; that it irritates the mucous membranes; that it is highly irritating to the gastro-intestinal tract; that allergy may result; that appetite is dulled; that it decreases the blood flow from 53 to 83 per cent; that it increases the blood pressure and the pulse rate; that it can produce palpitations and precordial pains. Have a smoke?

Jan. 10—If you have ever had any difficulty digging out an old amalgam restoration and you got black filings in your nose and on your fingers, you will probably be interested in a letter from an inventor in Holland who has some mysterious formula for dissolving the fillings in teeth so that it is not necessary to drill a cavity. The inventor neglected to say what the chemical might be.

Jan. 11—A speech, the first in the new year, before the Englewood Branch of the Chicago Dental Society on the subject of patient relationships.

Bob Gillis tells me of the work the Dental Institute of America is doing in carrying on educational efforts through the newspapers of the country.

Jan. 12—Unpremeditated humor—A request to publish a notice for a dental assistants society: "The tremendous turnout at our January meeting was a proof that more and more dental assistants and dental hygienists are professing an interest in the society. The presentation of the evening was really inspired and very enlightening. The eagerness, with which those present asked questions after the lecture, attested to the fact, that the dissemination of such knowledge was urgently needed." The speaker was a gynecologist who spoke



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THE DENTAL DIGEST

1005 Liberty Ave. Pittsburgh, Pa.

on "Birth Control Methods in Modern Marriage."

Lunched the same day with George Maxwell and Kenneth Bignell who described and helped clarify some of the mysteries of the spherical congruency of the human dentition.

Jan. 13—Sinclair Lewis has been called a "major Jeremiah." Lewis disclaims his rôle as reformer. He says he is a story-teller. Tonight's lecture was entitled, "The Novelist As a Prophet." He didn't get around to the guaranteed lecture but sliced into Mr. Dale Carnegie, Mr. Napoleon Hill, and the authors of other self-help books. The "slave-valet philosophy" of these personality salesmen, he objects to because they do not teach a philosophy for living but artificial methods for selling oneself with glibness, the forced smile, the insincerity, the backslapping. They do not teach people how to live better and more complete lives but how to sell more goods. Later, from the lecture to pub-crawling.

Jan. 17—Twenty-five years ago George Winter began his pioneering and introduced the term "exodontia" to the dental profession. A nice note from him came today saying that he is taking a South American cruise. Bon voyage.

Jan. 20—A birthday speech before the Chicago Dental Assistants Association on their fifteenth anniversary: "You have gone through the office girl stage, the maid-in-waiting stage, and are just beginning to come into your own as a professional group. You are the great grandchildren of dentistry chronologically. At fifteen years a person or an organization is at the peak of adolescence. At this period of transition, a person or an organization is beset with all sorts of conflicts and apprehensions. I wonder what you are confronted with at your adolescence? For one thing, I believe you will soon have to choose between professionalism and unionism. Organizations are springing up here and there in the country which are attempting to unionize certain types of professional workers—hospital employees, dental technicians, for example. I would not be at all surprised if some day a union organizer approaches your group and suggests that you form a union of dental assistants. You will be promised maximum hours and minimum pay. You will be shown, with glowing figures of speech, the picture of what you can accomplish by solidarity and collective bargain-

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THE DENTAL DIGEST

1005 Liberty Avenue **Pittsburgh, Pa.**

ing. Some of you will probably be attracted by the lures and will advocate such organization. Professionalism, it should be remembered, is the antithesis of unionism . . . Professionalism and unionism cannot exist side by side. If dentistry remains a profession, dental assisting must remain a profession. The fate of dentistry must determine the fate of dental assisting. Your profession cannot survive independent of dentistry nor in antagonism to it. Your future course must be determined by the welfare and best interests of dentistry as a whole . . ."

—E. J. R.

DENTAL MEETING *Dates*

The District of Columbia Dental Society will again act as host to the Five State Post Graduate Clinic, Mayflower Hotel, Washington, D. C., March 6-9, 1938.

•

Thos. P. Hinman midwinter clinic, Biltmore Hotel, Atlanta, Georgia, March 14-15.

•

Chicago College of Dental Surgery, Dental Department of Loyola University, Alumni Homecoming, Clinic, and Banquet April 4 and 5, 1747 West Harrison Street, Chicago. John C. McGuire, Pres., Emil Anderson, Sec'y.

•

Pennsylvania State Dental Society, seventieth annual meeting, Benjamin Franklin Hotel, Philadelphia, May 3-5.

•

Indiana State Dental Association, eighty-first annual meeting, Claypool Hotel, Indianapolis, May 16-18.

•

American Dental Society of Europe, Stockholm, Sweden, August 1-3, 1938.

•

A committee composed of members of the Class of 1908 of the New York College of Dentistry, New York University, met at a luncheon at the Hotel Pennsylvania, December 9. Plans were formulated to hold a reunion to celebrate the thirtieth anniversary of the class, sometime during March.